

BARNES

SERVICE MANUAL

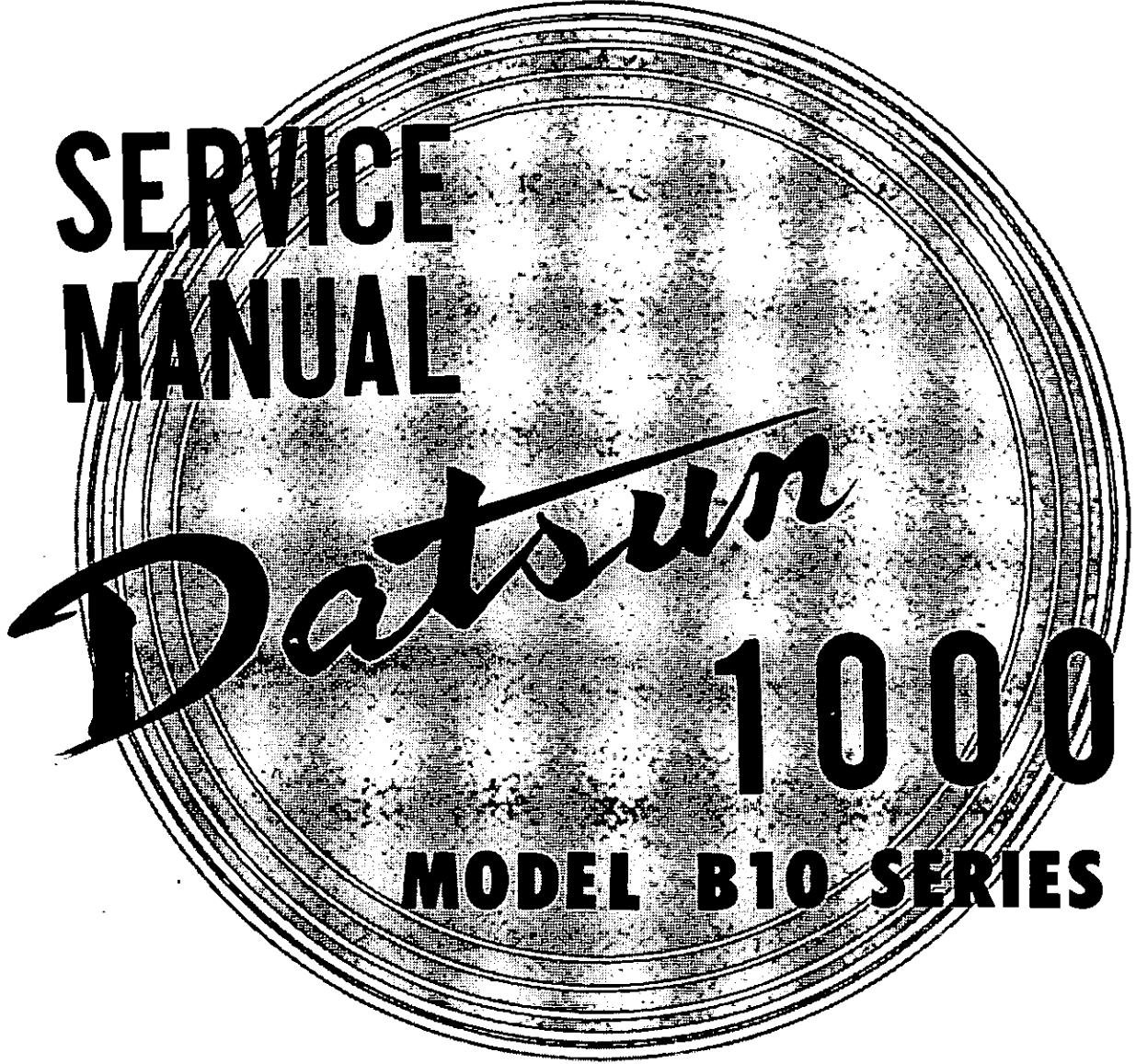
DATSUN 1000

MODEL B10 SERIES

NISSAN

NISSAN MOTOR CO., LTD. TOKYO. JAPAN

SERVICE MANUAL



Datsun
1000
MODEL B10 SERIES

NISSAN MOTOR CO., LTD.

**6-17-1 GINZA CHUOKU
TOKYO, JAPAN**

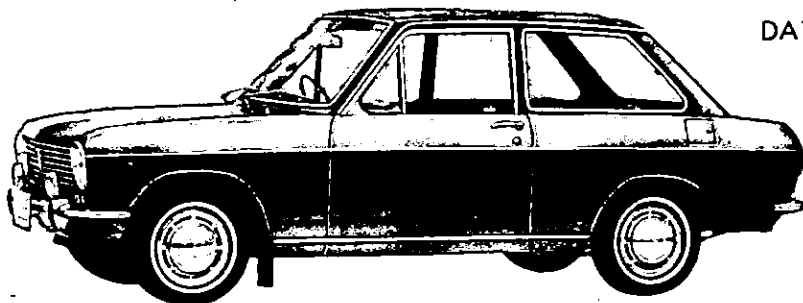
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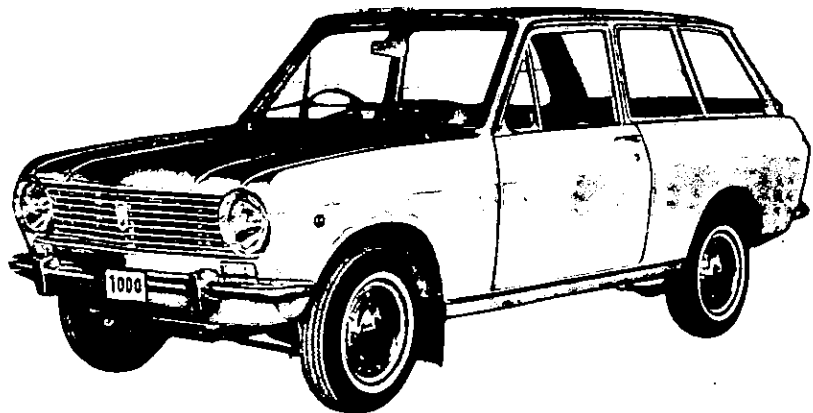
INTRODUCTION

This manual has been compiled for purpose of assisting DATSUN 1000 distributors and dealers for effective service and maintenance of the Model B10 Series. Each assembly of the major components is described in detail. In addition, comprehensive instructions are given for complete dismantling, assembling and inspection of these assemblies.

It is emphasised that only genuine DATSUN 1000 Spare Parts should be used as replacements.



DATSUN 1000 MODEL B10



DATSUN 1000 MODEL VB10

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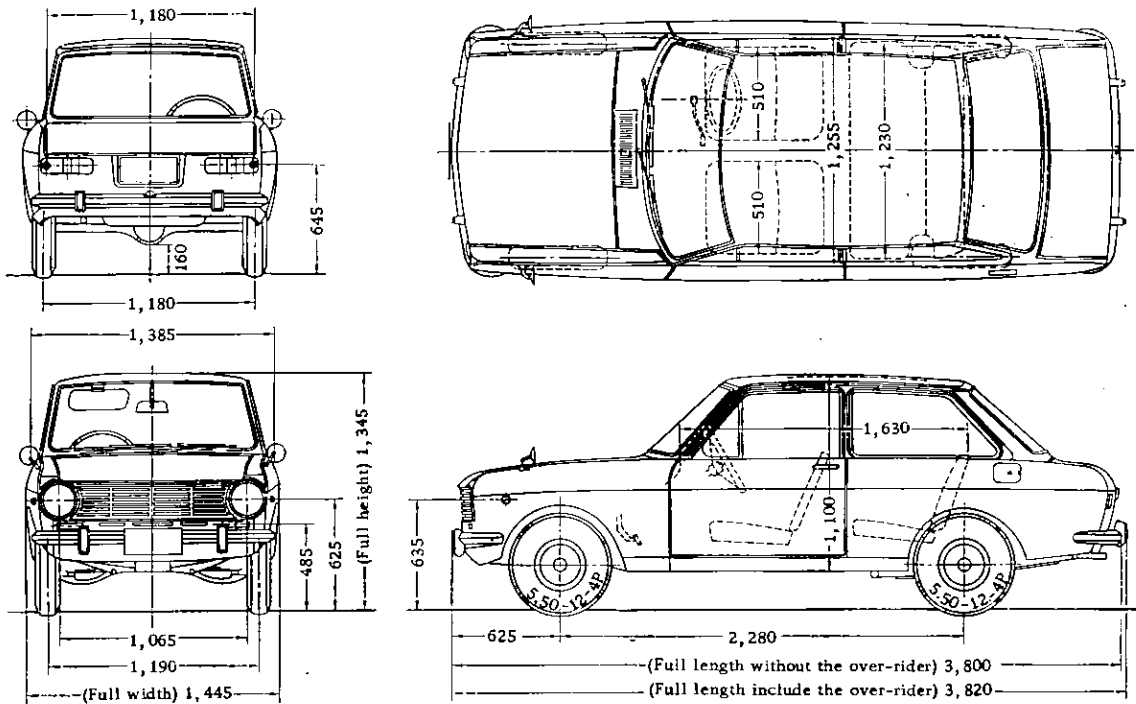
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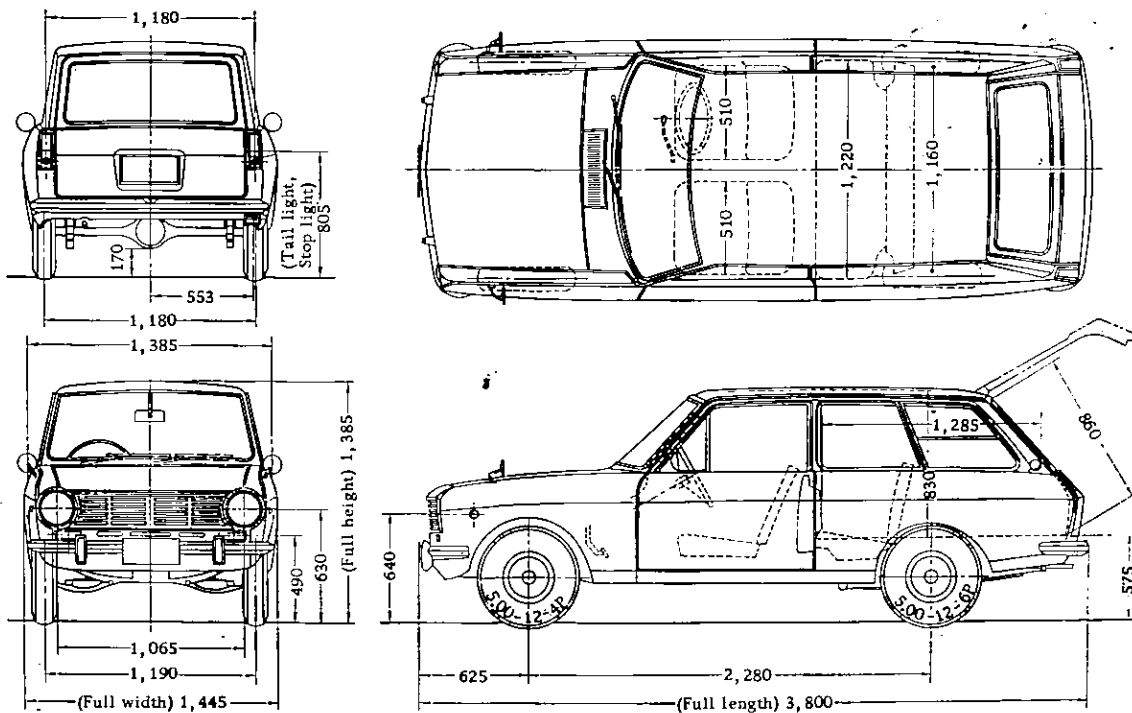
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GENERAL VIEWS OF B10

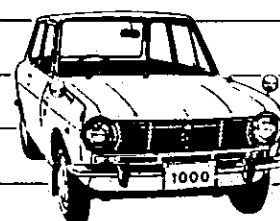


GENERAL VIEWS OF VB10



These specifications are subject to change without notice.

DATSUN 1000



GENERAL SPECIFICATIONS

GENERAL SPECIFICATIONS

ITEM \ MODEL		B10		VB10	
		S. T. D.	Deluxe	S. T. D.	Deluxe
Overall length		3,800 mm (149.6 in.)	3,820 mm (150.4 in.)	3,800 mm (149.6 in.)	3,820 mm (150.4 in.)
Overall width		1,445 mm (56.9 in.)		1,445 mm (56.9 in.)	
Overall height		1,345 mm (53.0 in.)		1,385 mm (54.5 in.)	
Wheel base		2,280 mm (89.8 in.)		2,280 mm (93.7 in.)	
Room space	I. L.	1,630 mm (64.2 in.)		1,285 mm (50.6 in.)	
	I. W.	1,255 mm (48.2 in.)		1,160 mm (45.7 in.)	
	I. H.	1,100 mm (43.3 in.)		830 mm (32.7 in.)	
Tread	Front	1,190 mm (46.9 in.)		1,190 mm (46.9 in.)	
	Rear	1,180 mm (46.6 in.)		1,180 mm (46.6 in.)	
Min. road clea.		160 mm (6.3 in.)		170 mm (6.7 in.)	
O. H. to the F. E. w/o. B.		580 mm (22.8 in.)		585 mm (23.0 in.)	
O. H. to the R. E. w/o. B.		875 mm (3.4 in.)		850 mm (3.3 in.)	
Vehicle weight		625 kg (1378 lb.)	645 kg (1422 lb.)	645 kg (1422 lb.)	665 kg (1466 lb.)
Max. I. A.	Right	49°		49°	
	Left	49°		49°	
Max. speed		135 km (100 MPH)	135 km (100 MPH)	130 km (97 MPH)	130 km (97 MPH)

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Grade ability sin θ		0.387	0.379	0.306	0.301
Min. turning radius		4.0 m (13.1 ft.)		4.0 m (13.1 ft.)	
ENGINE	Model		A10		
	Manufacturer		NISSAN MOTOR CO., LTD.		
	Classification		Gasoline		
	Cooling system		Water cooled		
	No. of cylinder & arrangement		4 in line		
	Cycle		4		
	Combustion chamber		Wedge		
	Valve arrangement		O. H. V.		
	Bore \times Stroke	mm	73 \times 59 (2.87 \times 2.32 in.)		
	Displacement	ℓ	0.988 (60.3 cu.in.)		
	Compression ratio		8.5		
	Compression pressure kg/cm (r.p.m.)		12.0/350		
	Max. exploding pressure kg/cm (r.p.m.)		48/4,000		
	Max. mean effective pressure kg/cm (r.p.m.)		9.75/3,600		
	Max. power HP/r.p.m. (SAE)		62/6,000		
	Max. torque (SAE) m-kg/r.p.m.		8.5/4,000 (61.5 ft-lb/4000 r.p.m.)		
	Length \times Width \times Height	mm	547 \times 553 \times 590		
	Weight	kg	91.5		
	Position		Front		
	Type of piston		T Slot		
Material of piston		LO-EX			
No. of Piston ring	Pressure Oil	2 1			

GENERAL SPECIFICATIONS

ENGINE	Valve timing	Intake open	12° B. T. D. C.	
		Intake close	48° A. B. D. C.	
		Exhaust open	50° B. T. D. C.	
		Exhaust close	10° A. T. D. C.	
	Valve Clearance	Intake mm	0.35	
		Exhaust mm	0.35	
	Starting method		Starter Motor	
IGNITION SYSTEM	Firing Method		Battery coil type	
	Ignition timing B. T. D. C./r.p.m.		8°/600	
	Ignition order		1-3-4-2	
	Ignition coil	Type	C14-51	
		Manufacturer	HITACHI	
	Distributor	Type	D412-53	
		Manufacturer	HITACHI	
		Type	L45	
IGNITION	Spark Plug	Manufacturer	HITACHI	
		Thread mm	14	
		Cap mm	0.7 ~ 0.8	
FUEL SYSTEM	Carburetor	Type	DCG286-3	
		Manufacturer	HITACHI	
		Throttle vlv bore mm	26	28
		Venturi size mm	20 × 7	24 × 7
		Main jet mm	0.95	1.40
		Slow jet mm	0.80	0
		Power jet mm	0.60	
		Air Draught	Down	

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FUEL SYSTEM	Air cleaner	Type	Paper element
		Manufacturer	TSUCHIYA
	Fuel pump	Type	Diaphragm
		Manufacturer	SHOWASEIKI
		Fuel Tank Capacity	35 (for B10), 30 (for VB10)
Lubricating system		Lubrication method	Forced full flow
		Oil pump type	Trochoid type
		Oil filter	Paper filter
		Oil pan capacity	2.5
Cooling system		Type	Pressure feed water cooled
		Radiator	Corugated fin & tube type
		Capacity of cooling water	4.5
		Type of water pump	Centrifugal type
		Thermostat	Pellet type
Battery		Type	N40L
		Voltage V	12
		Capacity A. H.	40
Generator		Type	LT125-01
		Manufacturer	HITACHI
		Generating method	Alternator
		Voltage V	12
		Capacity W	250
		Voltage regulator	TL1Z-10A
Starter		Type	S114-87
		Manufacturer	HITACHI
		Voltage & power V-HP	12V-1.0

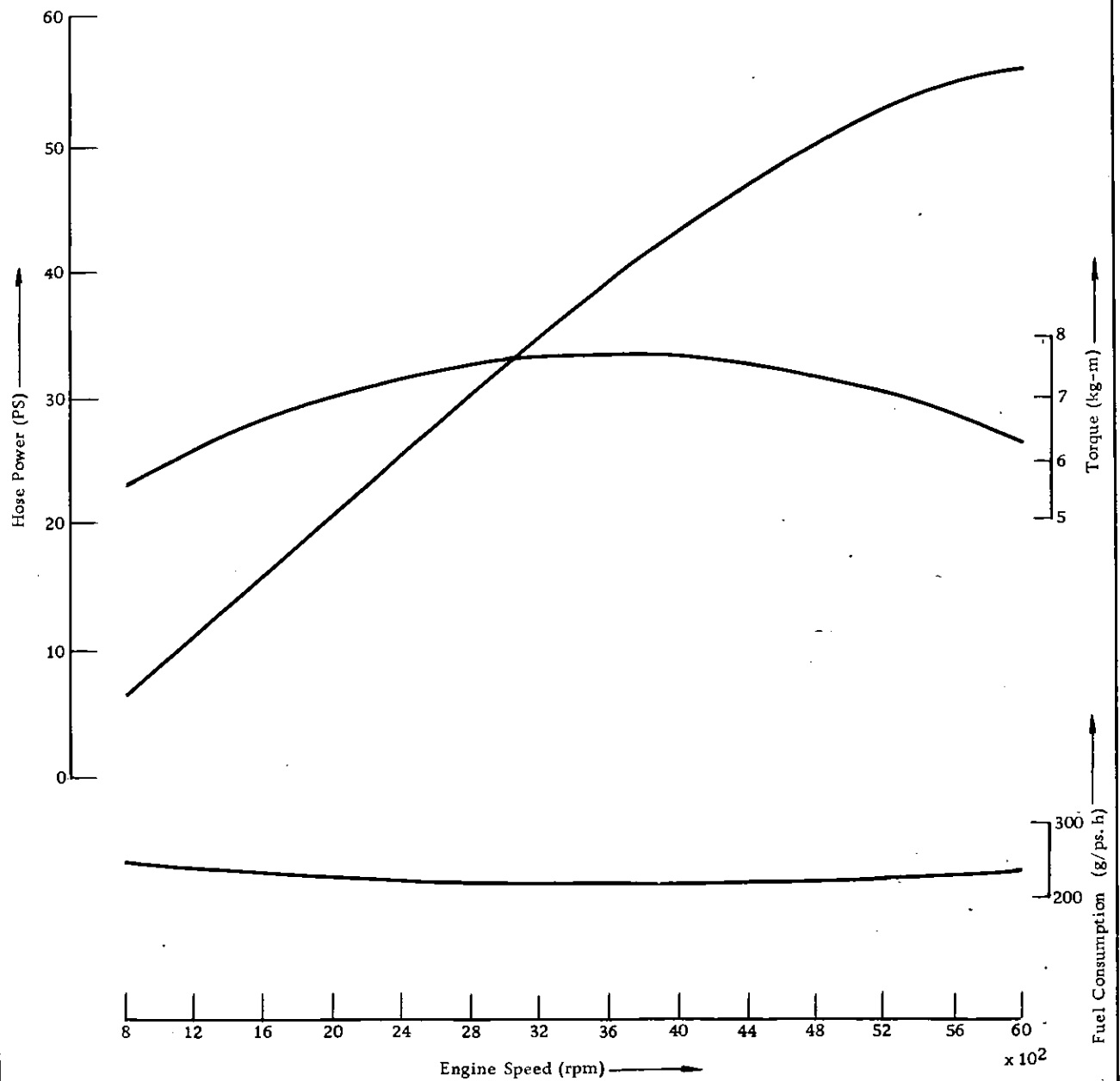
GENERAL SPECIFICATIONS

TRANSMISSION DEVICE	CLUTCH	Type		Single dry disc	
		Number of place		1 (Facing 2)	
		Out. dia. × In. dia. × Thickness mm		160 × 110 × 3.2	
		Total friction area			

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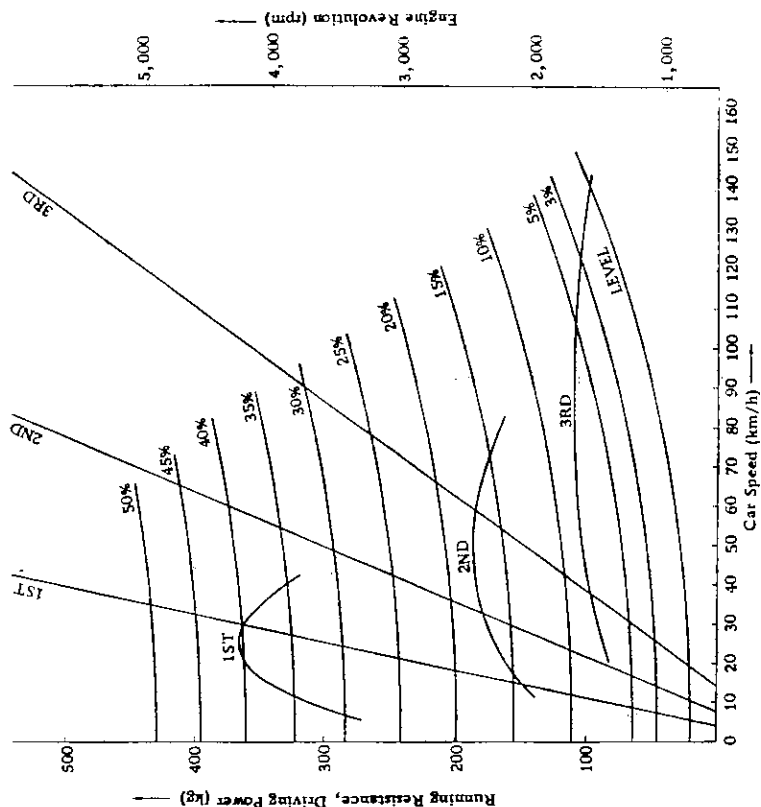
RUNNING DEVICE	Camber (unloaded)		1°45'
	Caster (unloaded)		2°15'
	Inclination angle of king pin		6°30'
	Type of rear axle		Semi-floating type
BRAKE SYSTEM	MASTER BRAKE	Type	Front: 2 leading Rear : leading and trailing
		Lining dimension (front) mm	35 × 4.8 × 195
		Lining dimension (rear) mm	35 × 4.8 × 195
		Total braking area (front) cm ²	273
		Total braking area (rear) cm ²	273
		Inner dia. of drum (front & rear) mm	203.2
	OIL BRAKE	Inner dia. of master cylinder mm	17.46
		Inner dia. of wheel cylinder front mm	20.64
		Inner dia. of wheel cylinder rear mm	20.64
		Max. oil pressure kg/cm ²	175
BRAKE	PARKING BRAKE	Type	Mechanical for ear wheels
		Lining dimension mm	35 × 4.8 × 195
		Total braking area cm ²	273
		Inner dia. of drum mm	203.2
SUSPENSION	Front		Transverse leaf spring
	Spring size	Out. dia. × Length mm	976 × 50 × 4-6
	Rear		Semi-elliptic leaf spring
	Spring size	Length × Width × Thickness - No. mm	1,150 × 50 × 7-2 (B10) 50 × 7-2 1,150 × 50 × 5-1 (VB10) 50 × 11-1
	Helper spring mm		
	Shock absorber	(Front)	Telescopic type double action
	Shock absorber	(Rear)	Telescopic type double action

MODEL B10 ENGINE PERFORMANCE CURVE



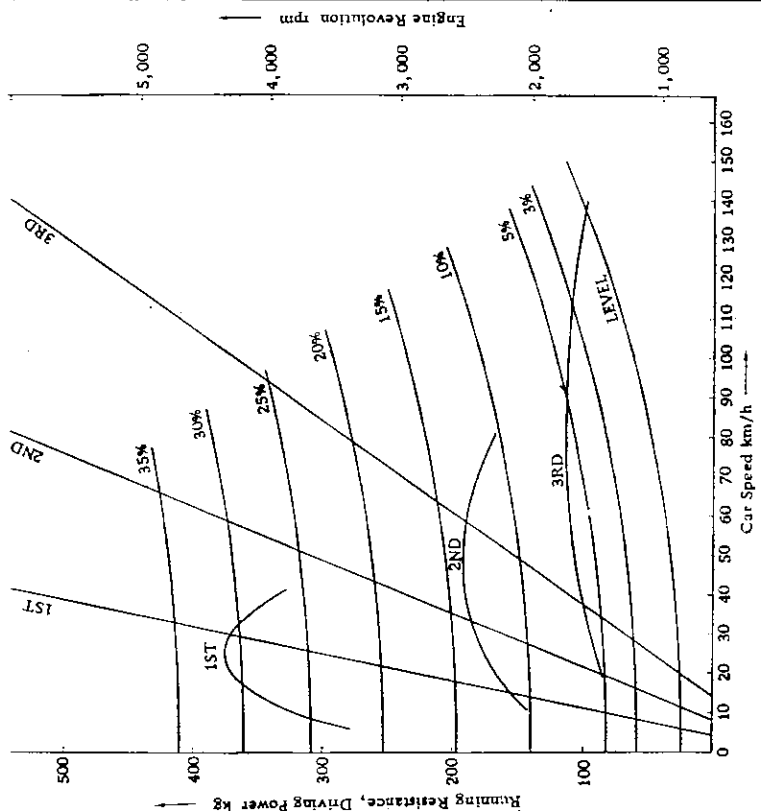
MODEL B10 RUNNING

Final gear ratio	4.111
1st speed ratio	3.380
2nd speed ratio	1.734
3rd speed ratio	1.000
Max. grade ability	920 kg
Max. torque	7.7 kg-m/3,600 r.p.m.
Max. B. H. P.	56PS/6,000 r.p.m.



MODEL VB10 RUNNING

Final gear ratio	4.375
1st speed ratio	3.380
2nd speed ratio	1.734
3rd speed ratio	1.000
Max. grade ability	1,175 kg
Max. torque	7.7 kg-m/3,600 r.p.m.
Max. B. H. P.	56PS/6,000 r.p.m.



SERVICE DATA

SERVICE DATA

Tightening torque	Tightening torque (kg-m)
ENGINE	
Cylinder head bolt	4.5 ~ 4.8
Main bearing cap bolt	5.0 ~ 5.3
Con. rod bearing cap bolt	3.4 ~ 3.6
Fly-wheel bolt	2.5 ~ 3.0
Camshaft sprocket	4.0 ~ 4.5
Rocker shaft bolt	2.0 ~ 2.3
Water pump nut	1.2 ~ 1.3
Oil pump bolt	1.3 ~ 1.5
Oil pan	0.5 ~ 0.6
Front cover	0.5 ~ 0.6
TRANSMISSION	
Front cover	1.0 ~ 1.4
Rear extension	1.6 ~ 2.2
FRONT SUSPENSION	
Hub nut (Without lubrication)	2.3 ~ 2.5
Hub nut (Coating with grease)	1.6 ~ 1.8
Hub nut (Beginning to turn motion)	Under 9 kg ~ cm
Front shock absorber bolt	2.2 ~ 2.8
Tension rod (Front side)	4.0 ~ 4.5
Tension rod (Rear side)	4.2 ~ 5.3
Suspension member fixing bolt	4.0 ~ 4.5
Upper ball joint	3.5 ~ 4.9
Upper ball fixing bolt	1.6 ~ 2.2
Lower ball joint	5.5 ~ 7.6
Lower ball joint fixing bolt	2.0 ~ 2.8
Upper link spindle fixing bolt	4.2 ~ 5.3
Lower link pin	4.2 ~ 5.3

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REAR SUSPENSION Rear shaft fixing bolt Rear shock absorber U bolt Rear spring front pin Rear spring shackle pin	1.5 ~ 2.0 2.0 ~ 2.5 3.5 ~ 4.0 3.5 ~ 4.0 2.0 ~ 2.5
GEAR CARRIER Gear carrier Pinion nut Drive gear Side bearing cap	1.5 ~ 2.0 14 ~ 16.8 3.0 ~ 3.5 4.2 ~ 4.9
STEERING Gear box fixing bolt Gear box side cover Gear rear cover Gear arm nut Gear arm cross rod Idler arm bracket Tie rod end Steering wheel nut	6.0 1.8 ~ 2.5 1.8 ~ 2.5 14.0 3.5 ~ 4.9 1.9 ~ 2.6 3.5 ~ 4.9 4.0 ~ 4.5

ENGINE

SERVICE DATA Oil content Cooling water Transmission Idling r.p.m. Fan belt slack Compression	3.04 ℓ (include oil filter 0.54 ℓ) distinct between level gauge mark Max & Min 0.6 ℓ 3.8 ℓ (with heater 4.5 ℓ) 2 ℓ (Radiator side) 1.8 ℓ (Engine side) 0.8 ℓ 600 r.p.m. 13-15 mm More than 10 kg/cm ² (350 r.p.m.)
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SERVICE DATA

<p>Spark plug gap</p> <p>Point gap (distributor)</p> <p>Ignition timing</p> <p>Vacuum</p>	<p>0.7 ~ 0.8 mm</p> <p>0.45 ~ 0.55 mm</p> <p>8°/600 r.p.m.</p> <p>More than 400 mm Hg/600 r.p.m.</p>
<p>CYLINDER HEAD</p> <p>Limit strain</p> <p>Thickness of gasket</p> <p>Allowable difference of each cyl. bore (inner dia.)</p> <p>Wear limit of inner dia.</p>	<p>Under 0.10 mm</p> <p>Free 1.10 Used 1.05</p> <p>An elliptic 0.015 Taper within 0.020</p> <p>0.2 mm</p>
<p>PISTON</p> <p>Clearance between piston and cyl. bore</p> <p>Fixing direction</p> <p>Piston oversize</p> <p>Measure with feeler-gauge between piston & cyl. bore</p> <p>Clearance between piston groove & ring</p> <p>Piston ring end gap</p> <p>Piston ring over size</p> <p>Method of inserting piston and pin</p>	<p>0.03 ~ 0.04 (at 20° C)</p> <p>F mark to front side Con. rod (oil hole to camshaft side)</p> <p>S.T.D. 0.25, 0.50, 0.75, 1.00, 1.25, 1.50</p> <p>Pull out measuring 0.5-1.5 kg with 0.03 mm thickness feeler</p> <p>Within 0.20 mm</p> <p>Within 1.0 mm</p> <p>S.T.D. 0.25, 0.50, 0.75, 1.00, 1.25, 150</p> <p>Press fit to piston and con. rod small end (1 ~ 1.5t)</p>
<p>CONNECTING ROD</p> <p>Allowable difference of gross weight with connecting rod & piston</p> <p>Alignment on a con. rod</p> <p>Material of big end bushing</p> <p>Connecting rod side clearance</p> <p>Clearance big end bearing</p> <p>Con. rod side clearance (thrust)</p> <p>Connecting bushing under size</p>	<p>Within 5 gram (for each weight diff.)</p> <p>0.05 mm (Allowable limit with pin on 100 mm length)</p> <p>F 500</p> <p>Within 0.4 mm</p> <p>0.01 ~ 0.05</p> <p>0.20 ~ 0.30 limit 0.40</p> <p>S.T.D. 0.008, 0.12, 0.25, 0.50, 0.75, 1.00</p>

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CRANK SHAFT Wear limit at pin portion of crank shaft journal Limit crank shaft alignment Side clearance of crank shaft Crank shaft journal oil clearance Portion of crank shaft thrust bushing Bushing over size of crank shaft journal Dimension of crank shaft journal Dimension of crank shaft pin	0.03 mm (elliptic or taper) Not to exceed 0.05 mm Within 0.3 mm 0.02 ~ 0.06 mm 2nd side S.T.D. 0.25, 0.50, 0.75, 1.00 49.951 ~ 49.964 mm 44.961 ~ 44.974 mm
CAM SHAFT Wear limit of cam shaft journal Limit of alignment of cam shaft Height of cam Wear limit of cam End play of cam shaft Clearance bushing & cam shaft Bushing under size	0.03 mm (elliptic or taper) 0.5 mm 36.45 ~ 36.55 (Inlet & Exhaust) 0.5 (at all height) 0.1 ~ 0.2 mm 0.03 ~ 0.07 mm (same journal for all) S.T.D. 0.25, 0.50, 0.75
VALVE Angle of valve face Diameter, valve stem Limit valve head thickness Dia. of stem Wear limit, valve stem Tappet clearance Clearance valve guide and guide inserting hole Clearance for valve seat inserting Limit of valve seat depression Valve seat over size Valve guide over size Valve spring (Free)	45° 30' (Inlet & Exhaust) 1.3 mm (Inlet & Exhaust) 0.5 mm (Inlet & Exhaust) 8.0 mm (Clearance to guide) Less than 0.10 mm 0.35 mm (Inlet & Exhaust, at hot) 0.02 ~ 0.04 mm 0.06 ~ 0.09 mm 0.2 mm S.T.D. 0.50 S.T.D. 0.50 45.7 mm

SERVICE DATA

Limit valve spring (Free length) Fix load & fixed length Clearance valve lifter & guide Clearance valve locker arm shaft	44.7 mm No. 1 30.0/38.5 No. 2 61.2/31.0 Within 0.15 mm 0.02 ~ 0.05 mm
FLY WHEEL Limit shake on the frictional face Nos. of teeth (ring gear)	0.2 mm 105
THERMOSTAT Temp. to operate Max. of valve lift	82° C More than 9 mm at 95° C
WATER PUMP Rotation ratio water pump pulley Current quantity	1.05 (for crank pulley) 85 $\frac{1}{2}$ / 400 r. p. m.
OIL PUMP Oil pump Oil pressure Thickness of adjusting shims for oil regulator Quantity of oil pumping $\frac{1}{2}$ / min-r. p. m.	Trocoïd gear type 3.5 ~ 4.0 kg/cm ² 0.5 mm 19.5/3000
FUEL PUMP Performance	750cc/3000 min-r. p. m.

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MANUFACTURER		HITACHI	mitsubishi
STARTER MOTOR			
Type		SS114-87	MW-V ₁ R
Constant		30"	30"
NO LOAD			
Terminal voltage (V)		12	11
Ampere (A)		Less than 60	Less than 60
Rotation (r. p. m.)		More than 7,000	More than 4,800
LOADED			
Terminal voltage (V)		6.3	6
Ampere (A)		Less than 420	Less than 470
Torque (kg. m)		More than 0.9	More than 0.68
Voltage for pinion out		Less than 8	Less than 9
Clearance shaft & bushing	Front	Less than 0.2 mm	Less than 0.2 mm
	Medium	Less than 0.45 mm	
	Rear	Less than 0.03-0.1 mm	Less than 0.2 mm
Alignment of shaft (Limit)		Less than 0.1 mm	
Out dia. of commutator (Standard)		33 ϕ	32 ϕ
Diameter wear limit of commutator		Less than -2.0 mm	
Run-out limit of commutator		Less than 0.2 mm	
Amendable accuracy of commutator		Less than 0.05 mm	
Depth mica		More than 0.2 mm	
Brush height		16 mm	15 mm
Wear limit		9.5 mm	7 mm
Spring tension (Standard)		800 g \pm 15 %	
Weakness limit		Up to 700 g	

SERVICE DATA

MANUFACTURER	HITACHI	NGK
ALTERNATOR		
Alternator	LT125-02	B-6E
Used rotation	1,050 ~ 12,000	
Constant revolution	5,000	2,500
14 Voltage/h revolution	Less than 1,050	Less than 1,100
Out-dia of spring	31 mm	33 mm
Wear limit (Dia)	0.5 mm	0.6 mm
Rotor coil	4.07 Ω	6 ~ 7 Ω
Rotor shaft run out	Under 0.10 mm	
Brush height (St)	19 mm	13 mm
Wear limit of brush	7 mm	7 mm
Strength of brush spring	300 ~ 380 g	300 ~ 400 g
REGULATOR		
Type	TLIZ10A	RL2220B5
No load regulated	14.0 \pm 0.5V	
GAP		
Voltage regulator	Yoke 0.9 ~ 1.0 Core 0.8 ~ 1.2 Point 0.4 ~ 0.5	Air 0.8 ~ 1.2 Back 0.8 ~ 1.1 Point 0.3 ~ 0.4
Pilot lamp realy	Yoke 0.2 Core 0.5 ~ 0.6 Point 0.4 ~ 0.5	Air 0.9 ~ 1.2 Back 0.8 ~ 1.1 Point 0.8 ~ 1.1

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MANUFACTURER	HITACHI	mitsubishi
DISTRIBUTOR		
Type	D412-53	TVA-4F ₁ L
Ignition timing	8°/600 r.p.m.	
Point contact angle	49 ~ 55°	
Point gap	(0.45 ~ 0.55 mm 15 TRS ~ 20 TRS)	
Contact arm spring tension	500 ~ 650 g	
ADVANCE CHARACTERISTIC		
Governor type	Commerce 450 r.p.m. Max. 12°/1,300 r.p.m.	0° ~ 18° at 500 r.p.m. 6.7° ~ 9.7° at 1,028 r.p.m. 11.0° ~ 13.0° at 1,440 r.p.m.
Vacuum type	Commerce -150 mmHg Max. 9.5°/-305 mmHg	0° ~ 1.7° at -160 mmHg 5.5° ~ 8.7° at 250 8.5° ~ 10.5° at -350 mmHg

IGNITION COIL		
Type	C14-51	HP5-10E
Primary voltage	12V	
Secondary voltage (3 ways spark gap)	More than 6 mm	
Primary coil resistance	3.2 ~ 4.1 Ω	
Secondary coil resistance	Below 20,000 Ω	Below 17,000 Ω

SERVICE DATA

MANUFACTURER	HITACHI	NGK
SPARK PLUG		
Type	L45	NGK B-6E
Screw × Reach × Hexagonal Length	14 × 19 × 20.6 mm	
Gap	27 to 31 TARS 0.7 ~ 0.8 mm	

BATTERY	
Type	NS40L
Capacity C20/h	32A.H
Specific gravity	1.260
	2.5 L
Discharge hour -15° C 150A	More than 2.5 minute
Voltage, 5 second -15° C 150A	More than 8.4 V

CLUTCH	
Setting height of diaphragm spring	31.5 mm
Wear limit of clutch facing	0.5 mm by the head of rivet
Disc facing run-out	Less than 0.5 mm
Play of with drawal lever	1.5 ~ 2.0 mm
Height of clutch pedal	144.5 mm
Play of clutch pedal	15 ~ 20 mm

TRANSMISSION

Type	Synchromeshed on the 1st, 2nd, & 3rd gear Reverse one stage
Gear ratio	1st 3,380, 2nd 1,734, 3rd 1,000 Rev. 3,640
Gear type	Helical gear type

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Back-lash of each meshing gear	Main drive gear-driven gear, second gears, first gear
Gear ratio of speed meter	4.00 (16/4)
MAIN DRIVE GEAR	
Main drive gear Nos.	19
MAIN SHAFT	
Second gear teeth Nos.	25
First gear teeth Nos.	31
Reverse gear teeth Nos.	31
Reverse gear thrust clearance	0.15 ~ 0.25 mm
First gear thrust clearance	0.15 ~ 0.25 mm
Second gear thrust clearance	0.1 ~ 0.3 mm
Front gear thrust clearance	0.1 ~ 0.35
Clearance between boulk ring & each gear	0.8 ~ 1.45 mm
Cover adjusting shim	0.5, 0.2, 0.1 mm
Bearing type of spline	(Front) Ball bearing (Rear) Bushing
COUNTER GEAR SHAFT	
Driven gear teeth Nos.	29
Counter gear teeth Nos.	22
First gear teeth Nos.	14
Reverse teeth gear	13
Clearance of front thrust	0.02 ~ 0.08 mm
Thrust washer size	0.8, 0.9, 1.0, 1.1, 1.2, 1.3 mm
Bearing type of spline	Front & rear ball bearing
REVERSE IDLER	
Gear teeth Nos.	17
Clearance between shaft & bushing	0.032 ~ 0.077
Clearance between gear & adapter plate	0.1 ~ 0.5
Clearance to snap ring	0.1 ~ 0.4
FORK SHIFT	
Length of locking ball spring	* 16.4 mm at 7 kg

SERVICE DATA

PROPELLER SHAFT	
Play at pin of universal joint	Adjust by snap ring
Thickness of snap ring	1.58, 1.56, 1.54, 1.52, 1.50, 1.48, 1.46

DIFFERENTIAL GEAR CARRIER

SPECIFICATION	CAR MODEL	
	B10	VO10
Teeth Nos. of drive pinion	9	8
Teeth Nos. of drive gear	37	35
Final gear ratio	4.111	4.375
ADJUSTMENT		
Back lash between drive pinion & drive gear	Less than 0.10 ~ 0.15 mm	
Run-out of drive gear back side	Less than 0.08 mm	
Pre-load of drive pinion bearing	6 ~ 8 kg-cm	
Standard dimension of drive pinion	45 mm	
Back lash of side gear	0.1 ~ 0.2 mm	
Standard width of side bearing	17.50 mm	
ADJUST WASHER OF DRIVE PINION		
Parts No.	Thickness	
38125 18000	2.30 ~ 2.32 mm	
38126 18000	2.32 ~ 2.34 mm	
38127 18000	2.34 ~ 2.36 mm	
38128 18000	2.36 ~ 2.38 mm	
38129 18000	2.38 ~ 2.40 mm	
38130 18000	2.40 ~ 2.42 mm	
38131 18000	2.42 ~ 2.44 mm	
38132 18000	2.44 ~ 2.46 mm	
38133 18000	2.46 ~ 2.48 mm	
38134 18000	2.48 ~ 2.50 mm	
38135 18000	2.50 ~ 2.52 mm	
38136 18000	2.52 ~ 2.54 mm	

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38137 18000	2.54 ~ 2.56 mm
38138 18000	2.56 ~ 2.58 mm
38139 18000	2.58 ~ 2.60 mm
ADJUSTING SHIM OF DRIVE PINION	
Parts No.	Thickness
38153 18000	0.50 mm
38154 18000	0.075 mm
38155 18000	0.125 mm
38156 18000	0.250 mm
38157 18000	0.500 mm
SPACER OF DRIVE PINION	
Parts No.	Thickness
38165 18000	5.75 mm
38166 18000	6.00 mm
38167 18000	6.25 mm
THRUST WASHER OF SIDE GEAR	
Parts No.	Thickness
38424 18000	0.76 ~ 0.81 mm
38424 18001	0.81 ~ 0.86 mm
38424 18002	0.86 ~ 0.91 mm
ADJUSTING SHIM OF SIDE BEARING	
Parts No.	Thickness
38453 18000	0.050 mm
38454 18000	0.075 mm
38455 18000	0.125 mm
38456 18000	0.250 mm
38457 18000	0.500 mm

SUSPENSION

FRONT SPRING	
Dimension (L × W × T - Nos.)	976 × 50 × 4 - 6
Free chamber	120 mm
Spring constant	2.05 kg/mm

SERVICE DATA

FRONT SHOCK ABSORBER Stroke Absorbability extensile side (0.3/sec) Contractile side	130 mm 58 kg 20 kg	
REAR SPRING Length × width × thickness - Nos. Free chamber Spring constant Span	B10	VB10
	1150 × 50 × 7 - 2 156 mm 1.45 kg/mm 1150 mm	50 × 7 × 2 150 × 50 × 5 - 1 50 × 11 - 1 161.5 mm 3.95 kg/mm 115 mm
REAR SHOCK ABSORBER Stroke Absorbability extensile side (0.3/sec) Contractile side	160 mm 70 kg 105 kg	160 mm 25 kg 35 kg

STEERING

SPECIFICATION Steering gear type Steering gear ratio Max. turning angle of front wheels (Inside) (Outside) Steering gear oil Steering wheel dia. Play of steering wheel	Recirculating ball type 15 : 1 3.4 45° 36° 36' MP #90 0.24 l 400 mm At the top of around of wheel less than 20 ~ 25 mm
WORM BEARING ADJUSTING SHIMS Parts No. 48031 18000 48032 18000 48033 18000 48034 18000	Thickness 0.05 mm 0.07 mm 0.08 mm 0.10 mm

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48035 18000	0.20 mm
SECTOR SHAFT ADJUSTING SHIMS	
Parts No.	Thickness
48131 18000	1.52 ~ 1.53 mm
48132 18000	1.55 ~ 1.56 mm
48133 18000	1.58 ~ 1.59 mm
48134 18000	1.61 ~ 1.62 mm
48135 18000	1.64 ~ 1.65 mm
CLEARANCE	
Clearance of ball nut to direction of shaft	Less than 0.02 mm
Clearance between of shaft T groove & shim	Less than 0.1 mm
Clearance of sector shaft & bushing	Less than 0.12 mm

FRONT WHEEL ALIGNMENT

SPECIFICATION	
Toe-in	2 ~ 3 mm
Camber	1° 45'
Caster	2° 15'
King pin angle	6° 30'
Side slip	Less than 3 mm with each running distance 1 mm
Turning angle (Inside)	45°
(Outside)	36° 36'
Rotation torque front hub (Motive)	Less than 9 kg-cm
Clearance of front hub to direction along the shaft	Less than 0.08 mm
Clearance of ball joint to direction along the shaft	Less than 0.9 mm

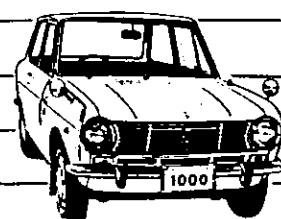
SERVICE DATA

BRAKE

ITEM	F & R	FRONT	REAR
FOOT BRAKE			
Type		Two leading	Leading trailing
Drum inner dia.		203.2 mm	Leading trailing
Drum over size		Less than 1 mm	Leading trailing
Drum inner dia. elliptic		Within 0.02 mm	Leading trailing
Drum cylindrical limit (at 35 mm from cylinder)		Within 0.02 mm	Leading trailing
Drum surface roughness		Honing by paper less than 1.6	Leading trailing
RETURN SPRING			
Wire dia. × Free length × Rolls		3.2φ × 118 mm × 20.5 rolls	Cyl. side 2.0φ × 119.2 mm × 28 rolls Adjuster side 2.0φ × 69.5 mm × 20 rolls
Fixed load × Fixed length		55 kg × 127.1 mm	Cyl. side 10.6 kg × 132.7 mm Adjuster side 8.6 kg × 76.7
WHEEL CYLINDER			
Inner dia.		20.64 mm	20.64 mm
Clearance between cylinder & piston		0.02 ~ 0.105 mm	0.02 ~ 0.105 mm
Limit of clearance		0.15 mm	0.15 mm
Piston spring (Free length × fixed length × fixing load)		28 mm × 16 mm × 1.1 ± 0.1 kg	28 mm × 16 mm × 1.1 ± 0.1 kg
LINING			
Length × width × thickness		35 mm × 195 mm × 4.8 mm	35 mm × 195 mm × 4.8 mm
Wear limit		More than 1 mm	More than 1 mm
Thickness over size (for service use)		5.3 mm (+0.5 mm)	5.3 mm (+0.5 mm)
PEDAL			
Height of pedal		144.5 ± 2 mm	
Remained stroke		More than 25 mm	
Play of pedal		10 ~ 15 mm	
Adjusting shim for pedal height		16 mm (Part No. 30611-27260)	

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	0.8 mm (Part No. 30612-27260) 0.5 mm (Part No. 30613-27260)
MASTER CYLINDER	
Inner dia.	17.46 mm
Remained pressure	0.3 ~ 0.7 kg/cm ²
Oil pressure (100 kg by foot)	175 kg/cm ²
Clearance between cylinder & piston	0.02 ~ 0.105 mm
Limit of clearance	0.15 mm





SERVICE MANUAL

ENGINE

MODEL B10 SERIES



NISSAN MOTOR CO., LTD.

ENGINE

ENGINE

This engine has three main bearings and use the valve lifters and hollow push rods to operate the individually mounted rocker arms which pivot on ball seats. A trocoid gear type oil pump driven by camshaft provides full pressure lubrication for portion of the engine.

The main oil gallery along valve lifter areas passes oil through drilled passages to each cam and main bearings, through the valve lifters and hollow push rods to the rocker arms.

The pistons are the split skirt type of aluminum alloy and carry two compression rings and a oil control ring.

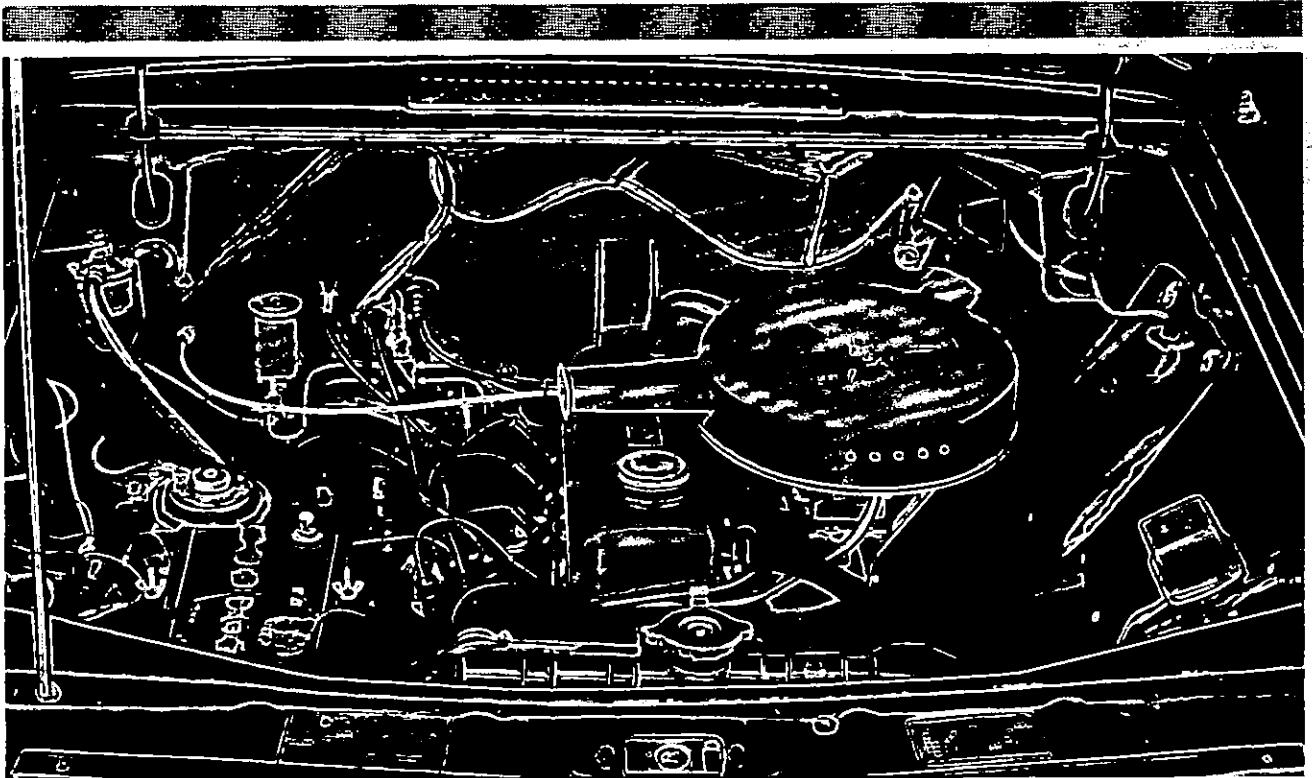
The piston pin is pressed in small end of connecting rods, which have steel backed lead and copper alloy, changeable big end bearings.

The counter balanced crankshaft is fitted. The end thrust on this component is taken by the second main bearing with flange.

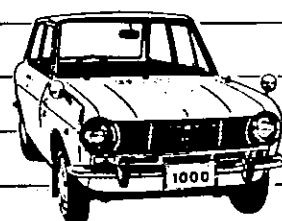
The centrifugal water pump and cooling fan are driven by the generator belt.

GENERAL SPECIFICATIONS

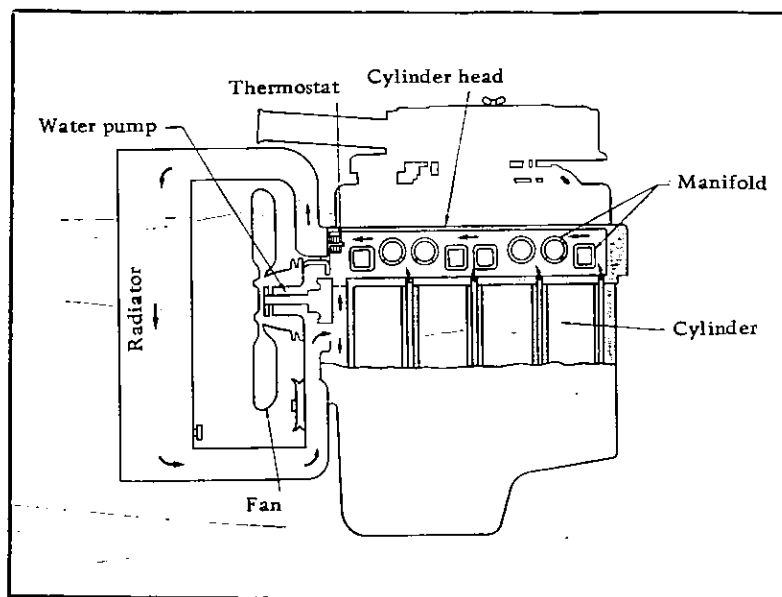
Design	4 cylinder in line 4 cycle O. H. V.
Bore x stroke	73 x 59 mm (2.87 x 2.32 in.)
Displacement	988 cc (61 cu. in.)
Compression ratio	8.5 : 1
Max. B. H. P. (SAE)	62 HP at 6,000 r. p. m.
Max. torque (SAE)	61.5 ft. - lb. at 4,000 r. p. m. (8.5 m.-kg. at 4,000 r. p. m.)
Ignition timing	8° B. T. D. C. at 600 r. p. m.



DATSUN 1000



COOLING SYSTEM



Cooling System

An efficient cooling system is of major importance to ensure the satisfactory running of the engine and it is therefore necessary to pay particular attention to its maintenance.

Description

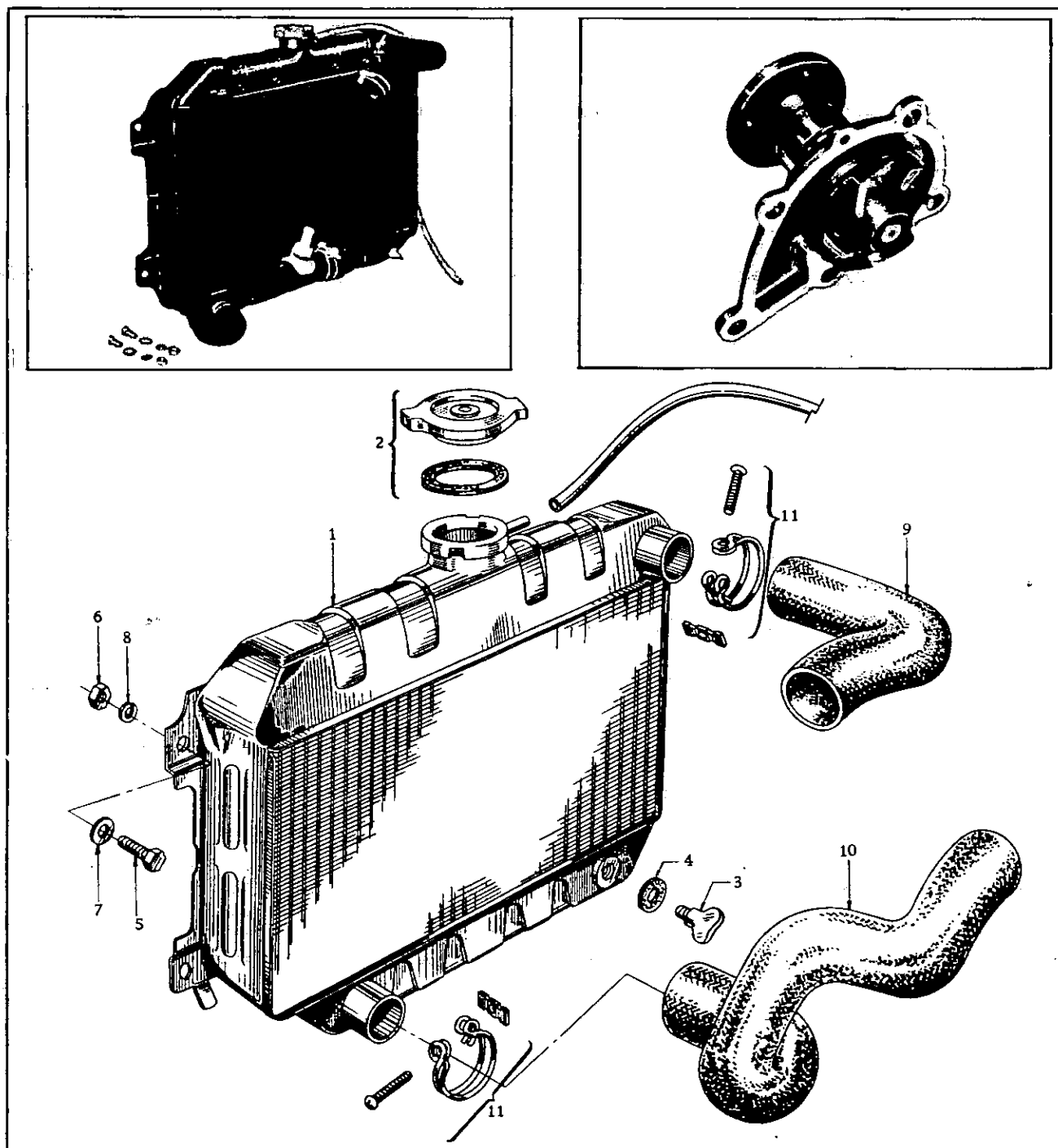
The cooling system is maintained by water pump circulation, combined with an efficient fan cooled radiator and thermostat.

The system is pressurised and the relief valve, incorporated in the radiator filler cap,

controls the pressure at approximately 0.4 kg per sq. cm. Do not remove the filler cap if the temperature of the coolant is above boiling point or if the engine is running. Topping-up should only be required occasionally to replace water lost through the overflow pipe. Top-up when the engine is cold, and if possible use clean soft water.

Fill to within 1/2 in. of the bottom of the filler plug well. Overfilling when the engine is cold may cause water to flow through the overflow pipe. The capacity of the system is approximately 4.5 liters.

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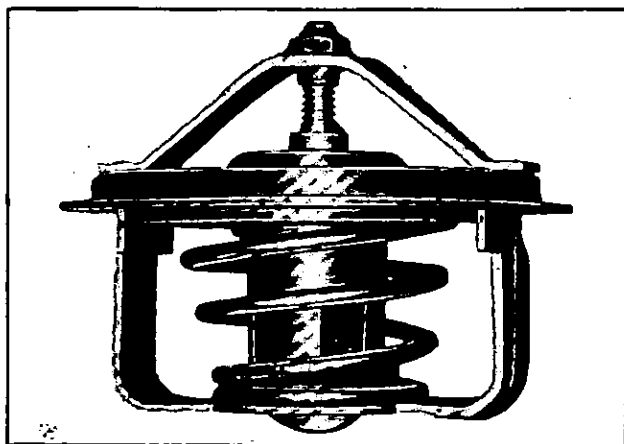
Radiator

1	Ass'y-radiator (for cooler)	5	Bolt	9	Hose-cylinder head to radiator
2	Ass'y-cap, pressure valve	6	Nut	10	Hose-radiator to water pump
3	Handle-drain cock	7	Washer-plain	11	Clamp-hose
4	Packing-drain cock	8	Washer-lock		

Thermostat

In order to ensure maximum efficiency, it is essential to keep the engine operating temperatures within certain limit. To assist this a pellet type thermostat is fitted, being located in the water outlet at front of the cylinder head.

Pellet type thermostat works by the principle of rapid variation of solution of wax.



Pellet Type Thermostat

The device consists of metallic pellet, filled with the wax, which controls a mash-room valve by solution of wax.

When the engine is cold this valve is closed and on starting the engine the flow of water to the radiator is temporarily restricted.

Due this, the temperature of the water in the cylinder head and cylinder jackets will quickly rise, thus ensuring rapid warming up.

The heat so generated will gradually press up the piston by shrinkage of synthetic rubber sleeve so opening the valve, and ultimately permitting a full flow of water to the radiator. The thermostat itself is detachable; therefore, should be occasion arise, it can be removed

from its housing and the hose reconnected to avoid laying up the car.

The thermostat opening is set by the manufacturer and can not be altered.

During decarbonising it is policy to test this opening by immersing the thermostat in water raised to requisite temperature. The valve should open under these conditions, but if it fails to open a new unit should be fitted.

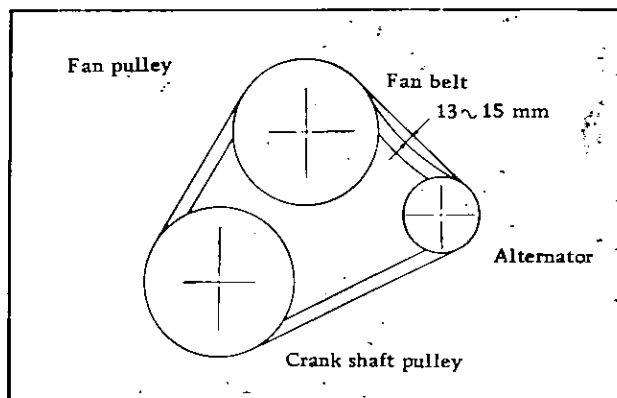
Overheating

Overheating may be caused by a slack fan belt, excessive carbon deposit in the cylinders, running with the ignition too far retarded, incorrect carburetor adjustment, failure of the water to circulate or loss of water.

Fan Belt Adjustment

The fan is driven from the crankshaft by a "V" belt, this also driving the alternator.

A new belt can be fitted by first loosening the clamp bolts, which hold the dynamo in position, and moving the dynamo towards the engine. Slide the belt over the fan and onto the fan pulley.



Fan Belt Adjustment

	Part No.	Rated Temperature
Standard	21200 61001	Open at $76.5^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$ Open fully at $90^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$
Optional for cold district	21200 61001	Open at $82^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$ Open fully at $95^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$

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Adjustment is then made by bringing the alternator away from the engine. The belt should be sufficiently tight to prevent slip, yet the belt should have 10 to 15 mm slack between the generator and crankshaft pulley when the midspan is pushed firmly.

After the correct tension has been obtained, securely lock it in position again.

Frost Precautions

Freezing may occur first at the bottom of the radiator or in the lower hose connections.

Ice in the hose will stop water circulation and may cause boiling. A muff can be used to advantage, but care must be taken not to run with the muff fully closed, or boiling will result. When frost is expected or when the car is to be used in a very low temperature, make sure that the strength of the solution is, in fact, up to the strength advised by the manufacturers. The strength of the solution must be maintained by topping-up with anti-freeze solution as necessary. Excessive topping-up with water reduces the degree of protection afforded. Solution must be made up in accordance with instructions supplied with the container.

Top-up when the system is cold.

If the cooling system has to be drained, run the mixture into a clear container and use again.

Protection by Draining

On cars where anti-freeze is not used the following precautions must be taken during frosty weather to obviate any damage due to freezing of the cooling system.

When heavy frost is imminent, the cooling system must be completely drained. It is not sufficient merely to cover the radiator and engine with rugs and masks. There are two drain cocks one on the left-hand side of the cylinder block and the other at the base of the radiator block. Both taps must be opened to drain the system and the car must be on level ground while draining.

The drain taps should be tested at frequent intervals by inserting a piece of wire to ensure that they are clear. This should be done immediately the taps are opened, so that any obstruction freed by the wire may be flushed out by the water. The draining should be carried out when the engine is hot.

When completely drained the engine should be run for a timed minute to ensure that all water has been cleaned from the system.

A suitable notice should be then affixed to the radiator, indicating that the water has been drained.

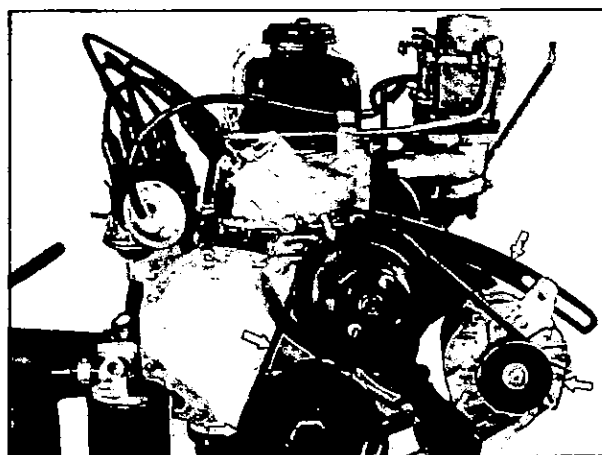
Flushing the Radiator

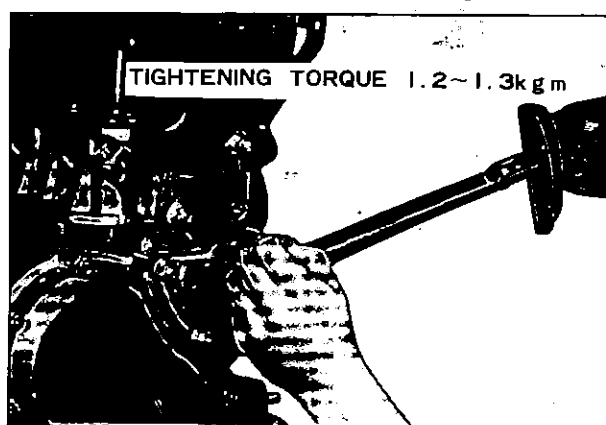
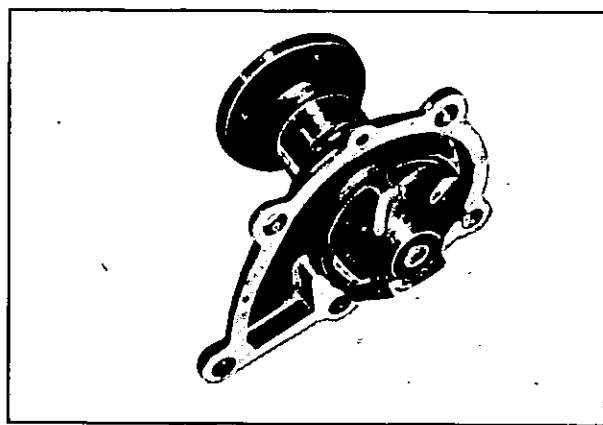
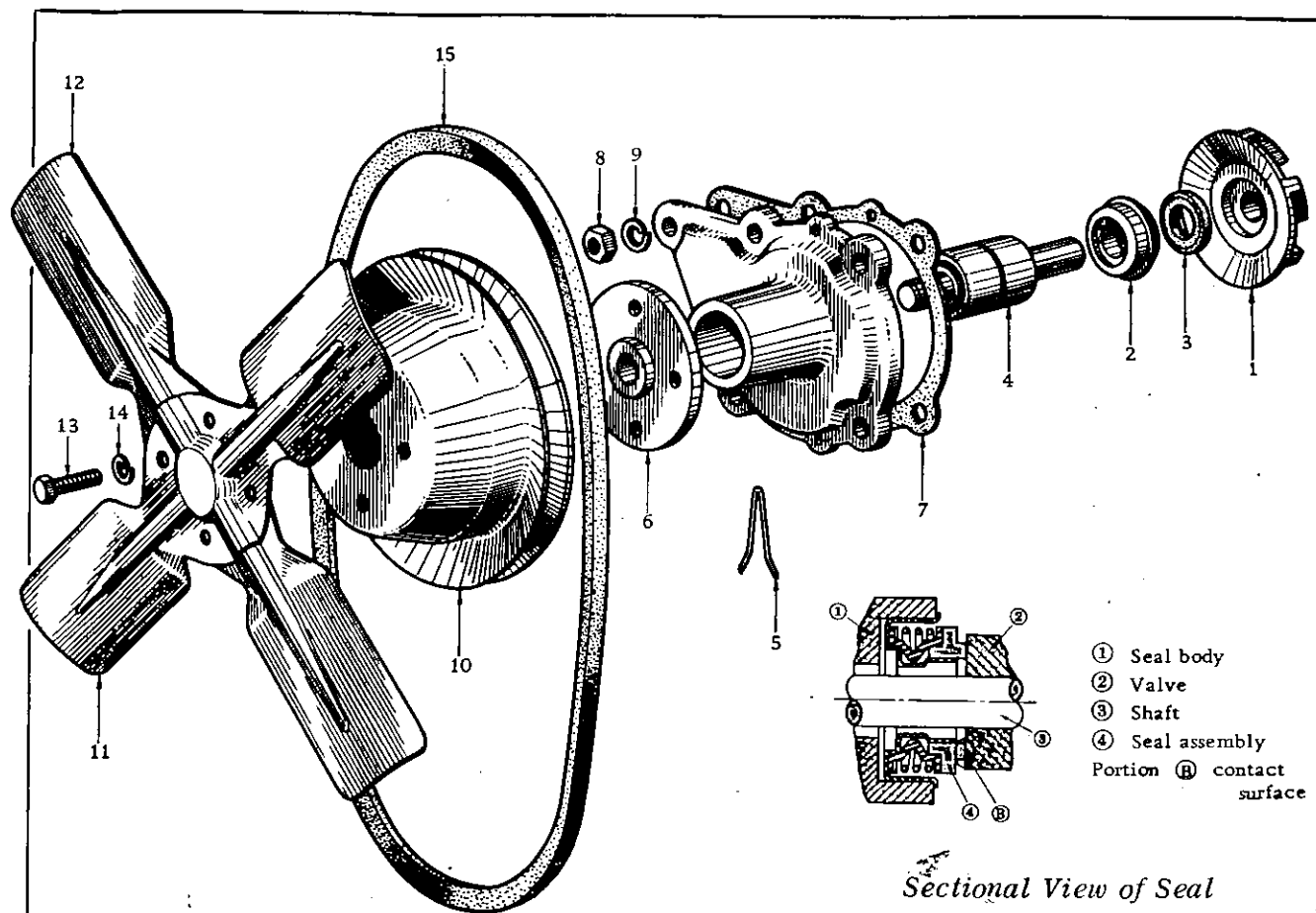
To ensure efficient circulation of the coolant and to reduce the formation of scale and sediment in the radiator, the system should be periodically flushed with clear running water, preferably before putting in anti-freeze in the winter and again when taking it out in the spring. The water should be allowed to run through until it comes out clear from the drain taps. At intervals a stiff piece of wire should be inserted into the taps during draining to ensure that they are not becoming clogged with sediment.

This method of radiator flushing may serve well, but in cases where the "furring" up is excessive the operator will find it more efficient practice to remove the radiator completely and flush in the reverse way to the flow, turn the radiator upside down and let the water flow in through the bottom hose connection and out of the top connection.

Water Pump

After draining the water from the radiator, remove the pump unit from the cylinder block by taking off the fan belt and releasing the set-bolts with spring washers and hinge bolts to the alternator.





Components of Water Pump

1	Vane-water pump.	9	Washer-lock
2	Ass'y-seal, water pump	10	Pulley-fan & water pump
3	Ass'y-seat	11	Blade-fan front
4	Bearing-water pump	12	Blade-fan rear
5	Wire-lock, bearing	13	Bolt
6	Hub-pulley	14	Washer-lock
7	Gasket-water pump cover	15	Belt-fan
8	Nut		

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Removing the Pump Shaft Assembly

Disconnect the fan blades, pulley and cover.

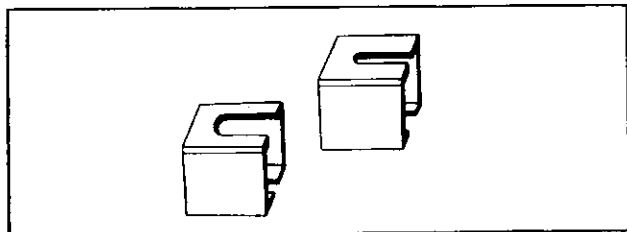
The shaft and ball bearings are combined with one unit.

Put the pulley hub on the bench.

First, press or knock the shaft end with a drift (hard bar) and draw out the pulley hub on the U type bench.

Take out the set pin from the slit which locked the shaft assembly to the pump body.

Next, turn the body upside down and press out the shaft assembly from the vane side on the U type bench.



Example of the Bench for Pump Body

The shaft and ball bearing assembly can be drew out from the body.

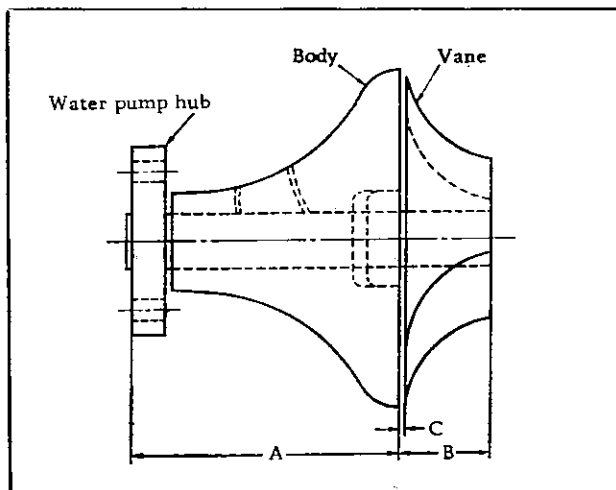
Thus take out the vane, floating seal and seal which remained the pump body.

The reassembling of the pump is a reversal of the disassembly procedure, but a care should be taken to ensure that the shaft assembly is fitted correctly for a slit (a hole of set ring) with a groove of shaft so as to insert and set the said ring correctly.

Adjusting Clearance the Vane End and Body

First, press down the shaft fitting with a groove line to insert the set pin.

Inserting thickness gauge (Thickness 0.4-0.5 mm) between the vane end on the U block bench. Take out the thickness gauge and find out good condition.

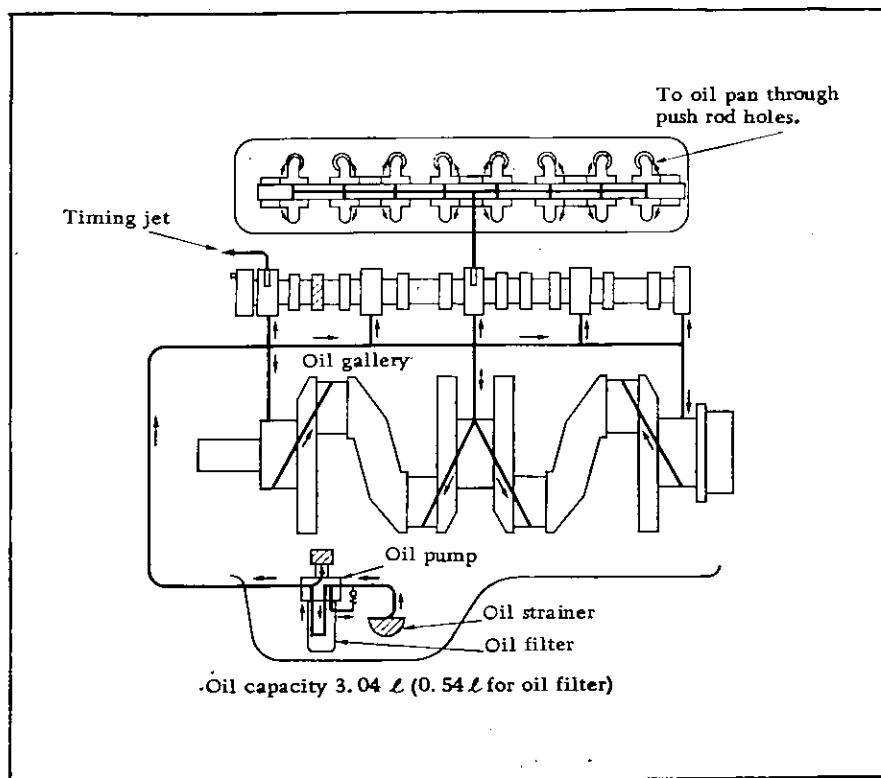


Adjustment of Water Pump

A	74.0 mm
B	19.5 mm
C	0.5 mm

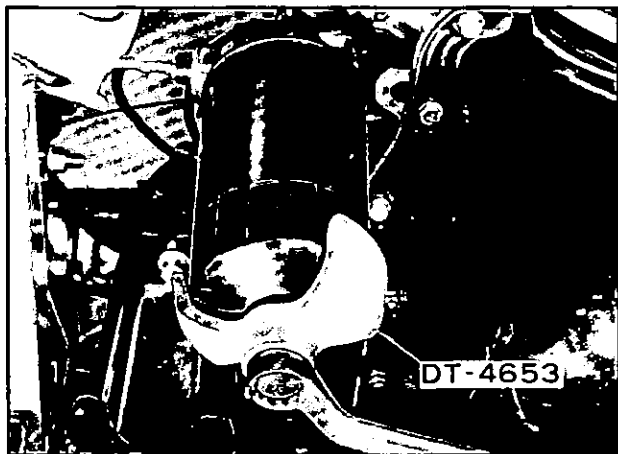
Hub	21054	18000
Bearing shaft	21035	13201
Seal ass'y	21026	73000
Seat ass'y	21027	73000

LUBRICATION

*Oil Passages***Circulation of Oil**

Pressure lubrication is used throughout the unit and is provided by an eccentric non-draining oil pump. The oil pump is bolted into the right-hand side of the cylinder block, and is driven from the camshaft gear by the drive gear.

The oil is drawn into the pump via the filter and is delivered through oil regulator which is situated at the lower body of oil pump.



From the relief valve the oil passes into the main oil gallery on the right-hand side of the engine. The flow then passes via connecting oilways to the main, big end and camshaft bearings through drillings in the crankshaft. The connecting ends are drilling in the cylinder block and the rear rocker shaft bracket, to lubricate the rockers, and then drains back into the oil pan via the push rod apertures. The oil from the center camshaft bearing enters a gallery on the left-hand side of the engine and lubricates the tappets through individual drillings. As the camshaft rotates, two grooves in the front journal register with a small hole in the camshaft thrust plate thus allowing a small amount of oil to pass into the timing case twice during case revolution of the camshaft to provide lubrication for the timing chain and gears.

From the timing case the oil returns via a drain hole back to the oil pan. The filter therefore forms part of the main oil gallery and as such is filled with oil under pressure.

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The full of the oil enters the element through holes in the cartridge, and passes through the element into the annular space round the center pipe.

This space is sealed top and bottom so that the oil can only escape through a small hole into the hollow center pipe and from this point back into the oil pan.

Draining the Oil

The oil on new and reconditioned engines must be drained and then filled with new oil after first 2,000 miles (3,000 km) and at intervals of every 3,000 miles (5,000 km). The drain plug is at the oil pan. The oil should be drained when the engine is hot as the oil will flow more readily.

Before filling the oil pan with new oil disconnect and change the oil cartridge.

Oil Pressure

The oil pressure should not drop below 30 lb./sq.in. (2.1 kg/cm²) on the gauge at normal road speeds, whilst approximately 10 lb./sq.in. (0.7 kg/cm²) should be shown when the engine is idling. New engines with new oil will give considerably higher readings at low speeds should there be a noticeable drop in pressure, the following points should be checked:

- a) That there is a good supply of the correct grade of oil in the oil pan.
- b) That the strainer in the oil pan is clean and not choked with sludge.
- c) That the bearings, to which oil is fed under pressure, have the correct working clearances excessive the oil will escape more readily from the sides of the bearings, particularly when the oil is warm and becomes more fluid.

This will cause a drop in pressure on the gauge as compared with that shown when the bearings are in good order. The relief valve in the lubrication system deals with any excessive oil pressure when starting from cold. When hot the pressure drops as the oil becomes more fluid.

Check for Low Oil Pressure

Check the level of oil in the engine sump by means of the dip-stick and top up if necessary. If the warning light is still on after refilling the sump, switch off and ascertain that the gauge strainer in the sump is clean and not choked with sludge, sale that no air leakage exists at the strainer union on the suction side of the oil pump being defective, remove the unit and rectify the fault.

Removing the Filter

A new filter cartridge should be changed after first 2,000 miles (3,000 km) and then every 10,000 km after this.

The filter forms part of the main oil gallery of the engine. The element of oil filter is selaed in the container as a unit, it can easily removed by hand. Take care not to lose the rubber sealing ring.

The filtered oil in the element of filter cartridge is sent to the oil passage in the cylinder block, delivered to all the lubrication system, crankshaft journal, crank pin, cylinder bore, locker arm, camshaft journal and chain tensioner, and finally returned to the oil pan.

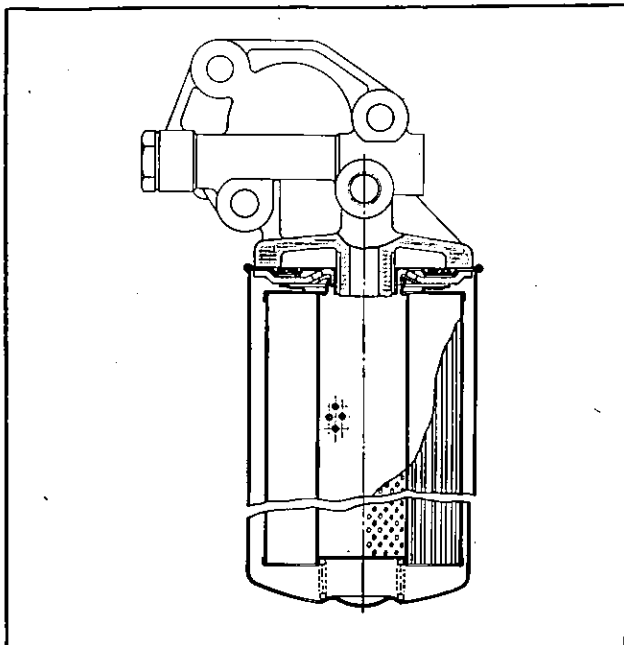
The oil filter is provided with a relief valve. If the temperature of lubricant oil is low at starting, oil viscosity is high, or if the filtration resistance of the oil filter element is large caused by its choke up, the relief valve will be opened with pressure difference to bypass oil.

Removing the Oil Pan

The sump capacity is 3.1 liters. Drain the oil and replace the drain plug.

Remove the set screw bolts which are inserted from the underside of the securing flange, and the lower bolts from the bottom edge of the bell housing. Lower the oil pan from the engine, taking care not to damage the joint washers in the process.

Removing the Strainer



With the sump lowered it is, possible to remove the oil strainer through which oil is drawn into the oil pump. To remove the strainer unto the union connecting the oil pick-up to the pump and unscrew the securing bolts.

The strainer may be dismantled for cleaning purpose by removing the delivery pipe flange bolts.

Notice that there are the dowel pins to the cover which must be positioned correctly when refitting.



Oil Filter

Removing the Oil Pump

Remove the oil pan and pick-up strainer. Three of the five bolts securing the oil pump bottom cover are long enough to secure the pump to the crankcase. Unscrew the long bolts and remove the pump with its drive shaft.

Dismantling the Oil Pump

Remove the setscrews and spring washers which secure the cover to the body and take off the cover. On tilting the body upside down the inner rotor with its drive shaft, and the outer rotor with slide out.

Refitting the Pump

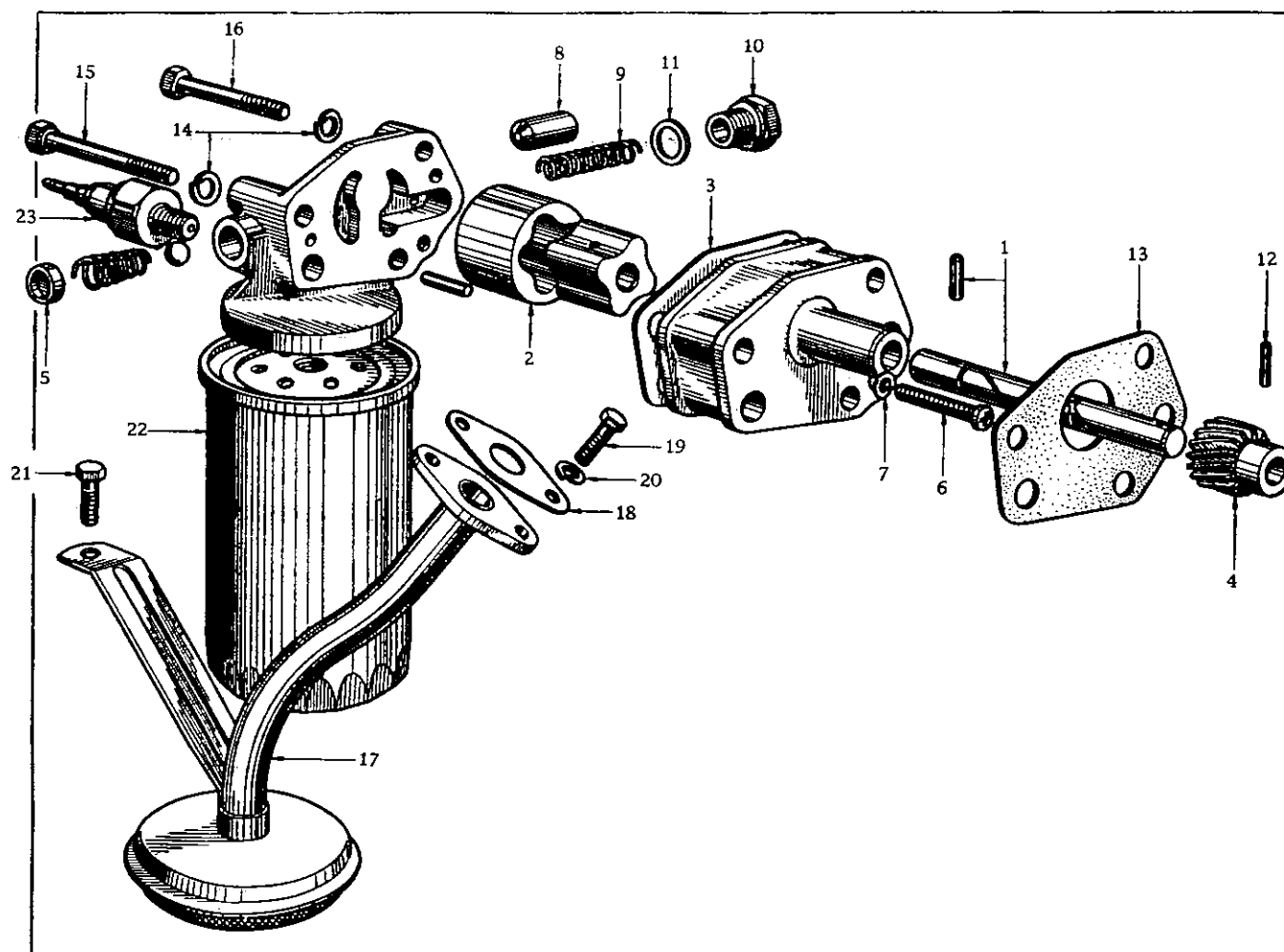
Clean out the sump by washing it in paraffin, the care to remove any traces of the paraffin before refitting the oil pan to the engine. Pay particular attention to the oil pan and crankcase joint faces, and remove any traces of oil jointing material. Examine the joint washer and renew it if necessary. The oil joint washer can be used again if it is sound, but it is advisable to fit a new one. Smear the faces of the joint with grease and fit the joint washer. Lift the oil pan into position and insert the setscrews into the flange tightening them up evenly.

Reassembling the Oil Pump

The outer rotor has a chamfered edge. It is of great important that this chamfer be towards the base of the body. Failure to assemble in this way will result in the cover is tightened down.

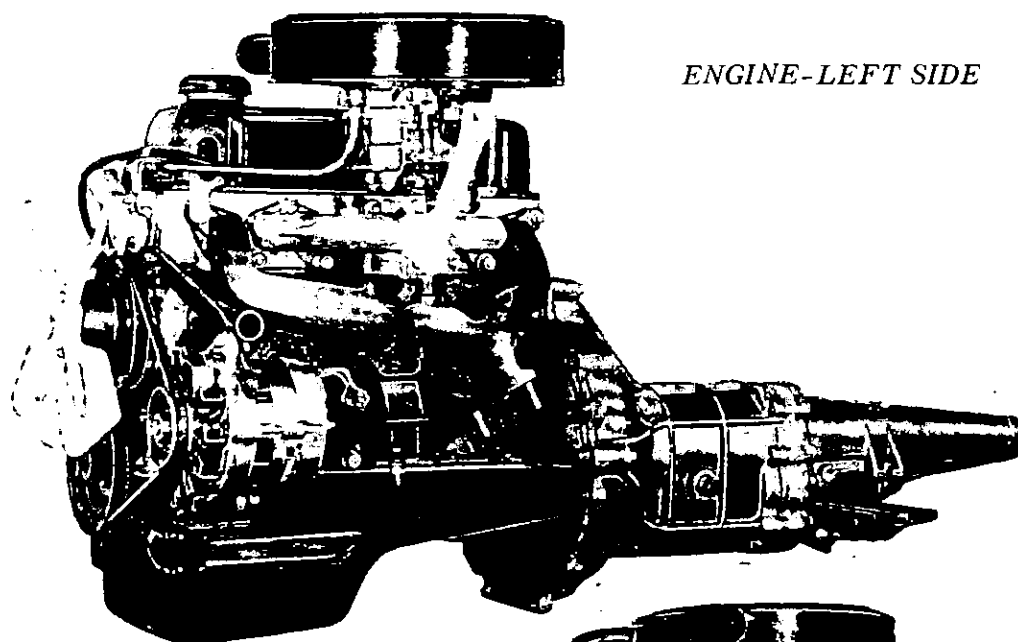
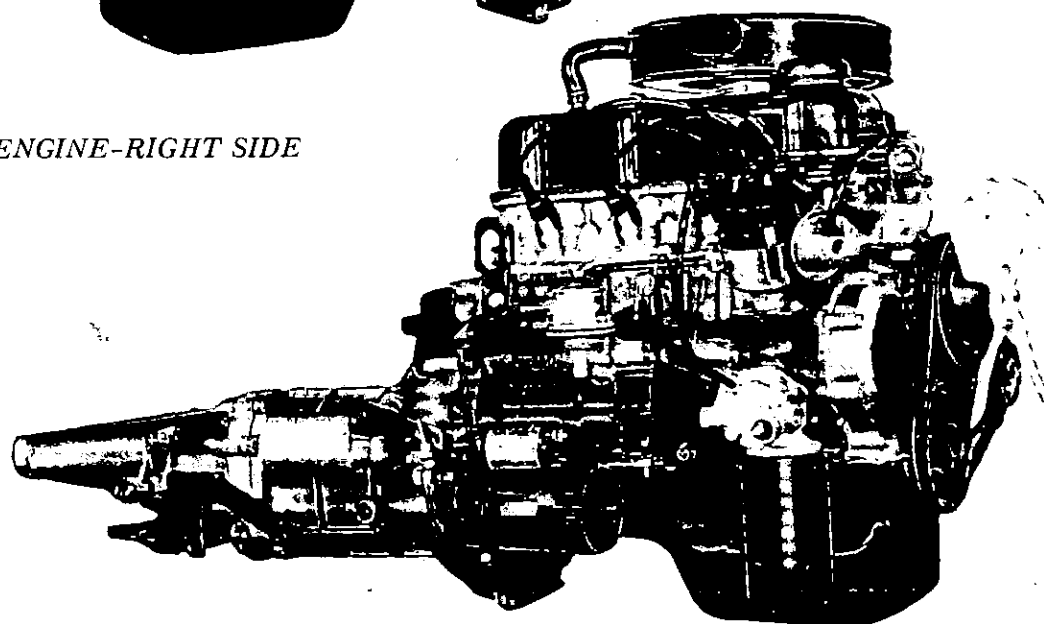
Insert the slotted end of the drive shaft into the body and bring the rotors into mesh.

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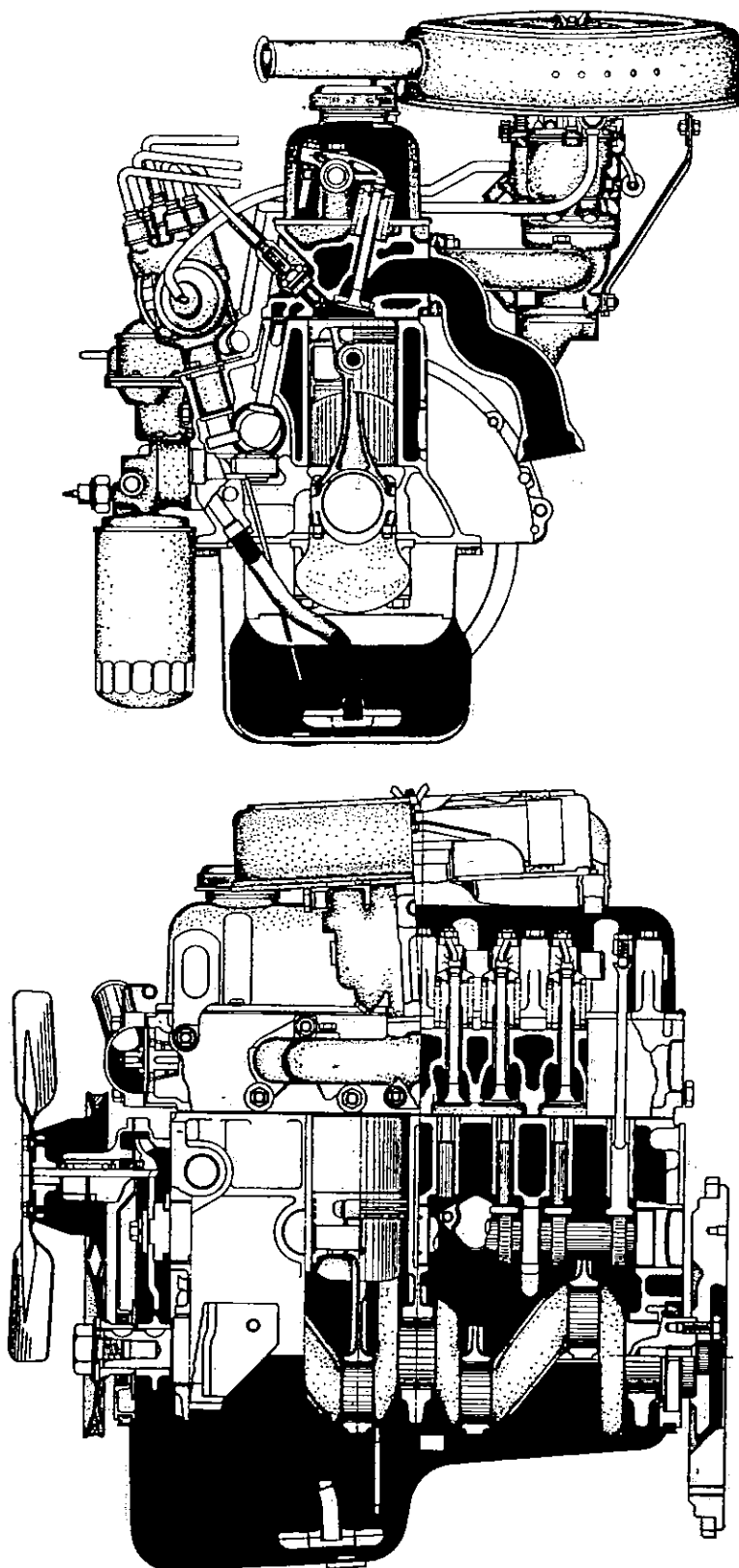
Oil Pump, Oil Filter & Oil Strainer

1	Ass'y-shaft, drive oil pump	13	Gasket-oil pump to cylinder block
2	Gear-drive	14	Washer-lock
3	Gasket-oil pump cover	15	Bolt
4	Gear-drive	16	Bolt
5	Plug-welch	17	Ass'y-strainer, oil
6	Bolt	18	Gasket-oil strainer
7	Washer-lock	19	Bolt
8	Valve-oil regulator	20	Washer-lock
9	Spring-oil regulator	21	Bolt
10	Plug-oil regulator	22	Ass'y-oil filter, cartridge
11	Washer-oil regulator	23	Ass'y-switch, oil pressure
12	Pin-slotted		

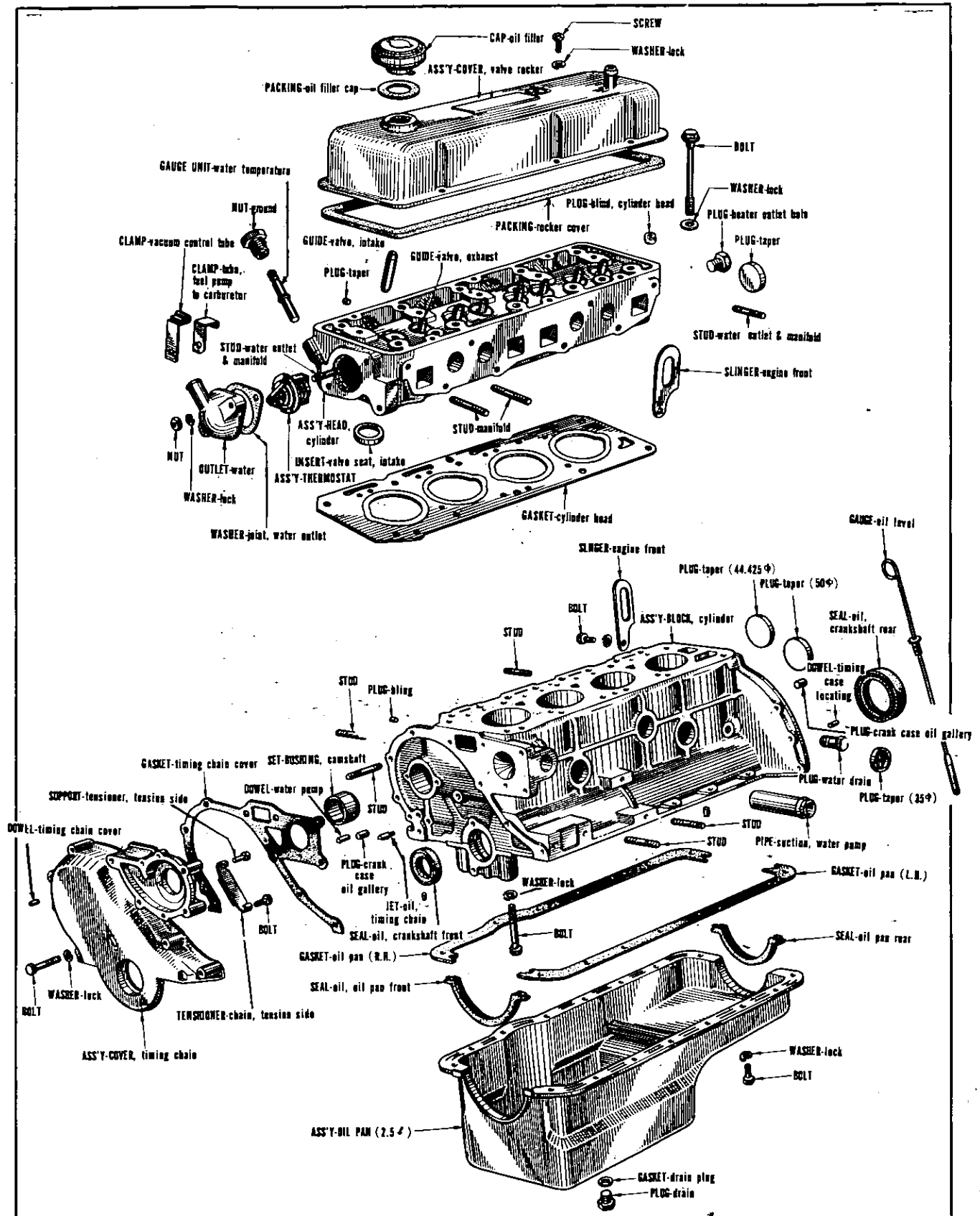
*ENGINE-LEFT SIDE**ENGINE-RIGHT SIDE*

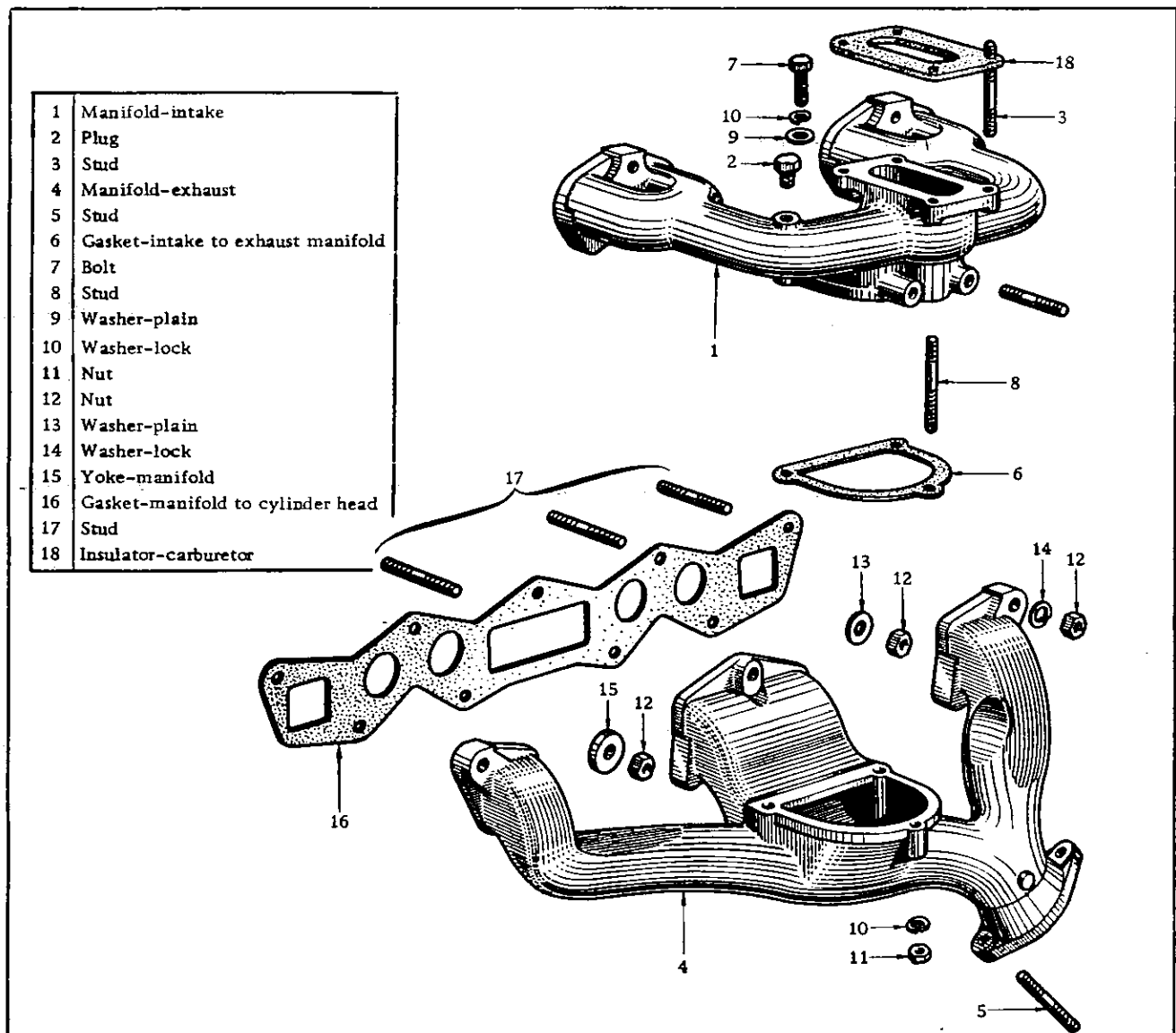
Tightening torque	(m-kg)
Cylinder head bolts	4.5 - 4.8
Main bearing cap bolts	5.0 - 5.3
Connecting rod bolts/nuts	3.4 - 3.6
Flywheel bolts	2.5 - 3.0
Cam shaft sprocket	4.0 - 4.5
Rocker shaft bolts	2.0 - 2.3
Water pump nuts	1.2 - 1.3
Oil pump bolts	1.3 - 1.5
Oil pan bolts	0.5 - 0.6
Front cover bolts	0.5 - 0.6

SECTIONAL VIEWS OF B10 TYPE ENGINE

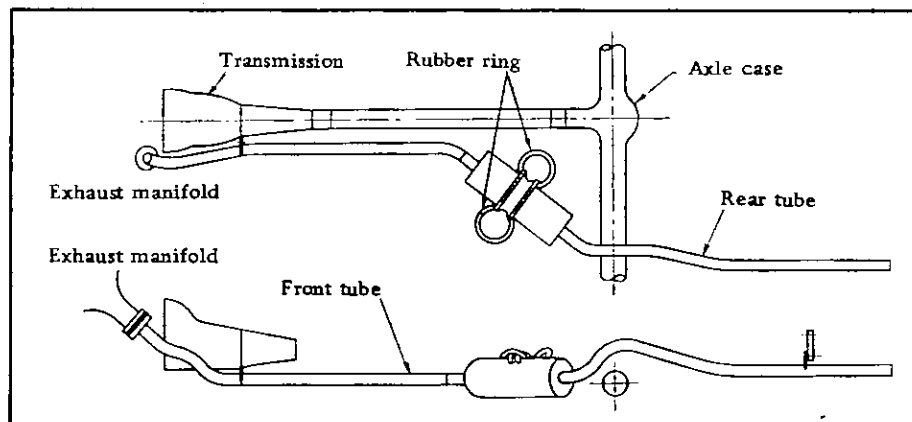


CYLINDER HEAD & CYLINDER BLOCK





Manifold



Exhaust Tube & Muffler

SERVICE OPERATIONS WITH ENGINE IN POSITION

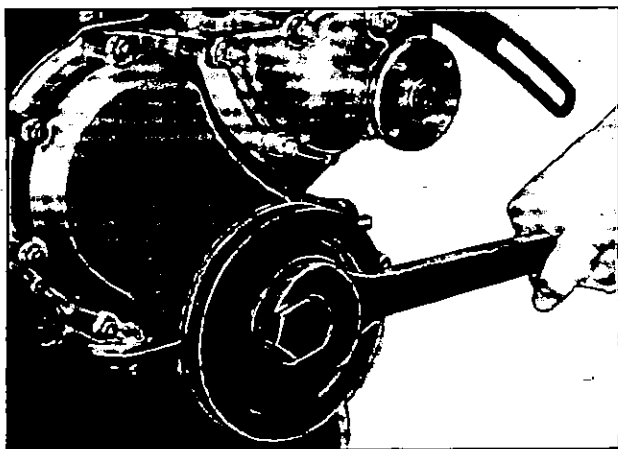
Removing Starting Nut and Pulley

Remove the radiator. Slacken the dynamo attachment bolts and remove the fan belt.

Bend back the tab on the starting dog nut locking washer. Unscrew the starting dog nut by using Heavy duty "Shock type" spanner.

A few sharp blows in an anti-clockwise direction will slacken the nut.

Pull off the crankshaft pulley.



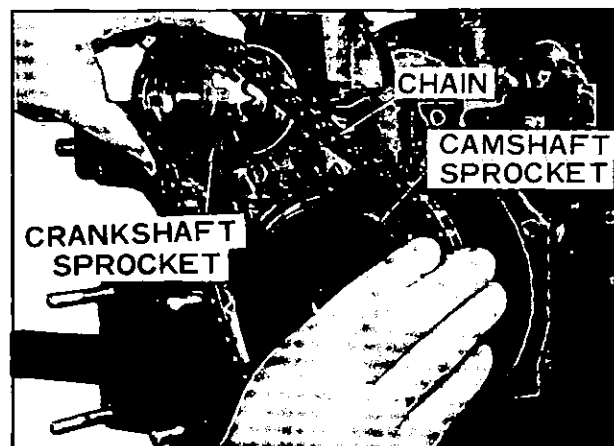
Removing the Timing Cover

The timing cover is secured by set-screw bolts, each having a shakeproof washer and a special plain-washer. Note that the special washer is of elongated shape and is fitted next to the timing cover flange.

The spring washers are immediately below the bolt heads.

Take out the set-screw bolts, remove the cover and its joint washer. Care should be taken not to damage the washer when breaking the joint. If damage does occur fit a new washer, cleaning of the faces of the joint surfaces beforehand.

Removing the Timing Gear



The timing chain is endless, and it is necessary to remove both the crankshaft and camshaft gears together. Before doing this, notice the timing marks on both gears and their relationship to each other.

Draw off both the gears a little at a time, first removing the crankshaft gear retaining nut.

As the gears are withdrawn care must be taken not to lose the packing washers from behind the crankshaft gear. Between the camshaft gear teeth, is a rubber ring which acts as a tentioner, and ensures silent operation of the chain drive. Examine the felt washer and renew it if oil has been lost by seepage.

Refitting the Timing Gear

Replacing the components of the timing gear is largely a reversal of the dismantling process, but special attention should be paid to the following points.

Fit the crankshaft and camshaft gears into their respective shafts. Ensure the timing marks are opposite and in line.

Turn the engine crankshaft until the keyway is at T.D.C. and the camshaft with its keyway in approximately the one o'clock position.

DATSUN 1000

Place the gears into position, ensuring that the keys are present in keyways on the shafts. Ensure that the timing marks on the gears are opposite to each other and in line. Drive the gears home.

The same number of packing washers taken from behind the crankshaft gear must be replaced unless a new crank or camshaft has been fitted. In this case the alignment of the gear faces and measure the alignment with a feeler gauge. To adjust the alignment it will be necessary to vary the number of packing washers.

Fit the oil thrower behind the crankshaft gear so that its concave face it towards the front of the car, and check that the felt washer is in position.

ROCKER MECHANISM

Valve Rocker Cover Removal

Remove the air cleaner. Unscrew the cap nuts securing the engine lifting brackets.

Remove the rocker cover and the cork joint washer.

Removing the Rocker Assembly

Drain the cooling system. If anti-freeze is in use, use a clean container for the fluid.

It is necessary to drain the system and slacken the cylinder head bolts, because four of the rocker shaft fixing nuts also secure the cylinder head.

If the cylinder head bolts are not slackened distortion may result and allow water to find its way from the cooling system into the cylinder and pump.

Notice that under the right-hand rear rocker stud nut is a special locking plate. Completely unscrew the rocker-shaft bracket nuts and remove the rocker assembly. Complete with brackets and rockers.

Dismantling the Rocker Shaft Assembly

To dismantle the rocker shaft assembly first remove the grub screw and locking plate from the rear rocker bracket.

Remove the split pins, flat washers and spring washers from each end of the shaft. Slide the rockers, brackets and springs from

the shaft. Unscrew the plug from the end of the shaft and clean out the oil way.

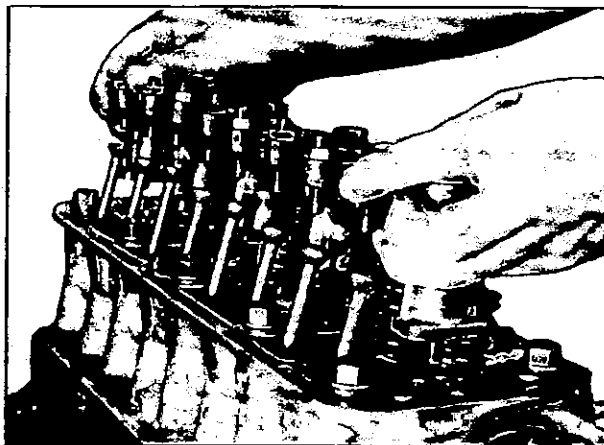
The two end rockers may be dismantled without the whole rocker assembly being drawn out. This may be achieved by turning the engine by hand until No. 1 push rod reaches its lowest position.

Unlock the tappet adjusting screw and screw it back as far as it will go.

Withdraw the split pin, flat and spring washer and slide the rocker off the shaft.

Sometimes the valve spring will have to be slightly compressed by levering a screwdriver under No. 2 rocker, thus allowing the end rocker to slide off the shaft easily. Repeat the procedure for No. 8 rocker.

Reassembling the Rocker

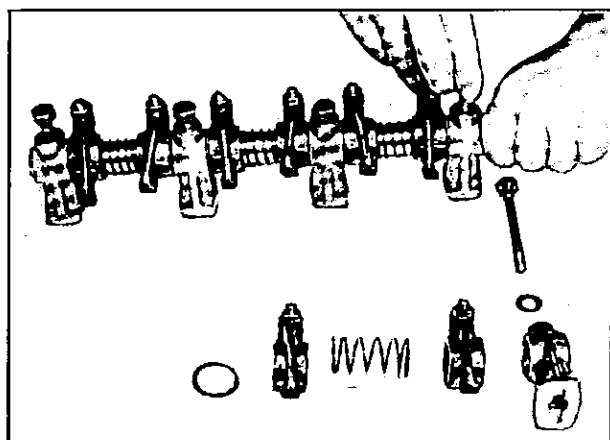


On reassembly tighten the pedestal bracket securing nuts a little at a time working diagonally from nut to nut, left nut of No. 1 pedestal bracket, right nut of No. 2, left of No. 3 and so on returning from the left nut of No. 4 bracket and repeating the process until they are all tight. If the rocker assembly has been completely stripped down and rebushed, the oil holes will have to be redrilled and the bushes reamed down to size before assembly on the shaft.



The rocker and spring must be replaced in their original position on the ends of the shaft. Remember to replace the rocker shaft locating screw and lock plate.

Replace the spring and flat washers with the split pins on the ends of the shaft. Replace the rocker cover and gasket.



Reassembling the Cylinder Head

The vent pipe should be at the front of the engine. Secure the cover by means of the two cap nuts, ensuring that the rubber bushed and engine lifting plates are in position. If the rocker cover gasket or the rubber bushes are found to be faulty, they must be renewed otherwise oil leaks will result.

Push Rod Removal

If the valve rocker assembly has already been removed all that remains is for the push rods to be lifted out. They may on the other hand be taken out without detaching the rocker assembly.

Remove the air cleaner and rocker cover.

Slacken all the tappet adjusting screws to their full extent; then using a screwdriver, with the rocker shaft as a fulcrum, depress the valve spring, slide the rocker side ways and lift out the push rod.

All but the end push rods can be withdrawn in this way. These will have to be withdrawn after the removal of the two end rockers from the shaft. When replacing push rods ensure that the ball ends register in the tappet cups. From here onwards, reassembly is a straight forward reversal of the dismantling process.

Adjusting Valve Rocker Clearances

Remove the air cleaner and rocker cover.

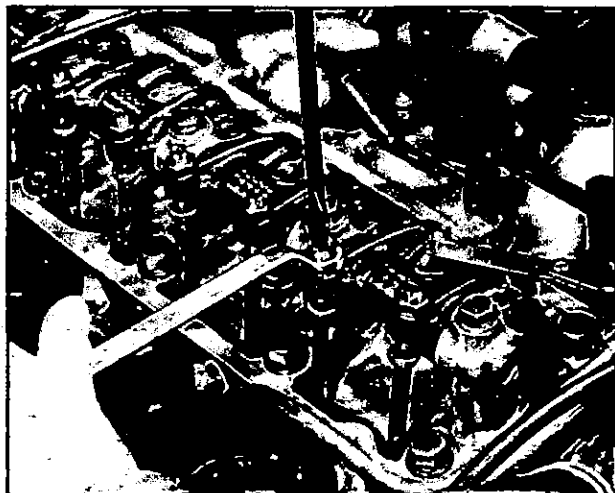
There should be a clearance of 0.014 in. (0.35 mm) between the face of the rocker and the base of the valve stem. Whilst checking the clearances it is important to maintain pressure with a screwdriver on the tappet adjusting screw to disperse the film of oil from the push rod cup. Failure to follow this procedure will result in a wrong reading being taken.

Turn the engine over by hand (starting handle) until the push rod stops falling, the valve is fully closed.

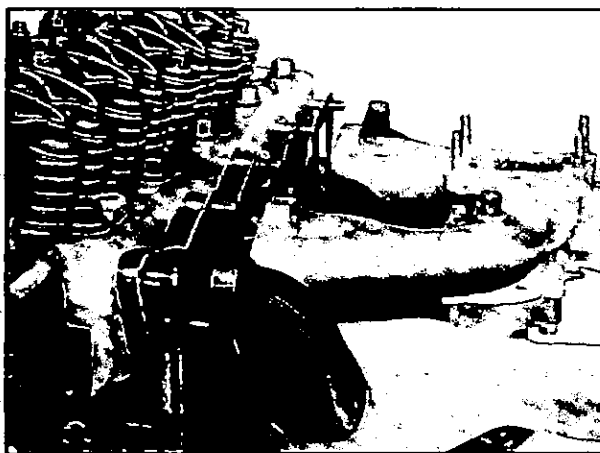
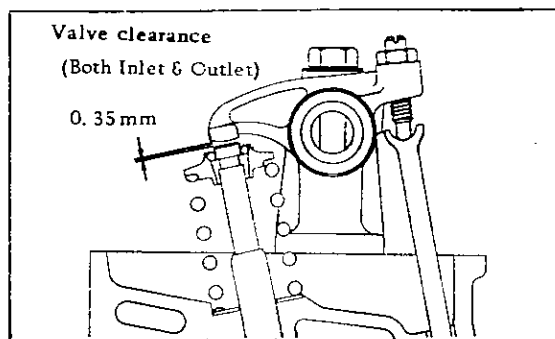
To adjust insert a screwdriver in the adjusting screw slot and slacken the lock nut. Then insert 0.014 in. feeler gauge between the face of the rocker and the valve stem. Raise or lower the adjusting screw until the correct clearance is obtained.

Tighten the lock nut and recheck the clearance.

It is important to note that while the clearance is being set, the tappet of the valve being adjusted must be on the back of the cam, opposite to its peak.



Adjusting the Rocker Clearance



CYLINDER HEAD

Removing the Cylinder Head

Drain water from the cooling system by opening the radiator and cylinder block drain cocks.

One is situated inlet tube at the backside of the radiator and other at the rear right-hand side of the engine. If anti-freeze mixture is in use it should be drained into a suitable container and retained for future use.

Disconnect the negative cable from the battery by extracting the terminal screw and removing the lug from the battery terminal post.

Slacken both the retaining clips on the hose connecting the radiator to the thermostat housing and remove the hose.

Extract the thermostat housing securing nuts and remove the housing and thermostat.

Remove the aircleaner, carburetor, rocker cover and the inlet and exhaust manifolds.

Detach the high tension cables and remove the sparking plugs, also disconnect the water temperature gauge connection from the thermostat housing.

Take off the rocker assembly not forgetting to slacken the external cylinder head nuts at the same time.

Withdraw the push rods keeping them in the order of removal.

The cylinder head can now be lifted off the cylinder block. To facilitate detaching the cylinder head joint, tap each side of the head with a hammer using a piece of wood interposed to take the blow. Do not use excessive force. When lifting the head a direct pull should be given, so that the head is pulled evenly up the studs. Remove the cylinder head gasket.

Decarbonising

Remove the cylinder head. With the valves still in position remove the carbon from the combustion chambers and the valve faces.

Leaving the valves in position for this operation ensure that damage cannot be caused to the seats by the wire brush which should be used for the removal of carbon.

If the exhaust valve heads are coated with a very hard deposit this may be removed by using a chisel shaped piece of hardwood.

Remove the valves, and using the wire brush clean out the carbon from the inlet and exhaust ports.

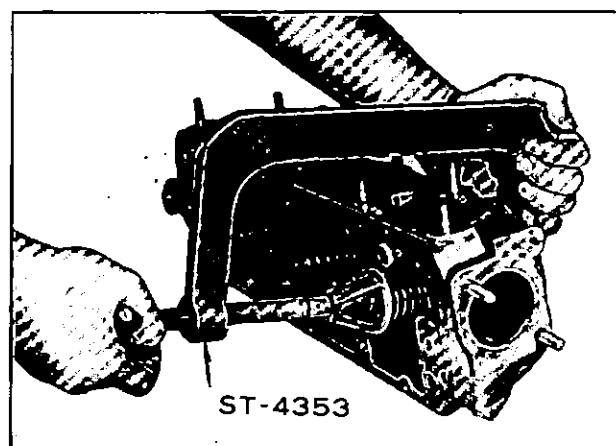
Blow out all traces of carbon dust with compressed air, and finally clean the ports with

gasoline and dry them. The carbon should now be removed from the piston crowns. Rotate the engine until the piston to be worked on is at T.D.C. Protect the other cylinder bore from the entry of carbon particles by pushing a non-fluffy rag into them.

Using a chisel shaped piece of hardwood. Carefully remove the carbon from the piston crowns. A ring of carbon should be left round the periphery of each piston, and the deposit round the top of the cylinder bore should not be touched. An indication as to when decarbonisation is require is generally given by an all round loss of power. Cars used mainly on short runs will require this attention more often than those used for long runs.

Removal and Replacement of the Valves

Whilst the cylinder head is removed the valves can be taken out. To do this compress the valve spring with the speical valve spring compressor as shown in Figure.



Valve Spring Compressor

Removal

Remove the two cap retaining collets.

Release the valve spring, the valve spring cap, valve oil seal (Inlet valve only) and its retainer. Withdraw the valve from the guide.

Keep the valves in their relative positions when removed from the engine, to ensure replacement in their original valve guides.

Replacement

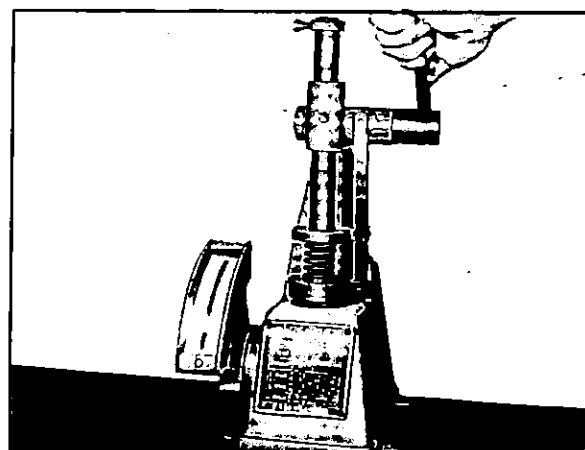
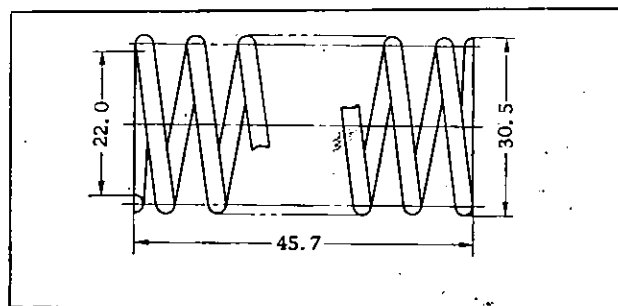
Note that the diameter of the exhaust valve heads are smaller than the inlet valve. To replace the valves, insert each valve into its guide and replace the spring, oil seal and retainer. Fit oil seal chamfered side downwards. The oil seals are more easily fitted if they have been soaked in engine oil for a short period before use. The oil seal is used for the intake valve only.

Replace the valve spring and compress the valve spring.

Refit the cap retainers and secure them by means of the valve cotters. Remove the compressor.

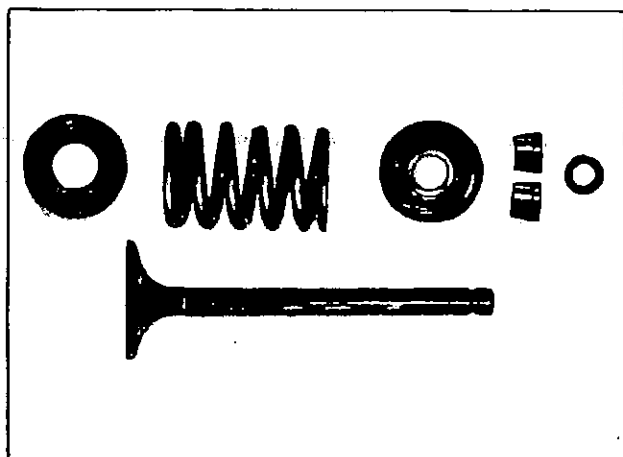
Spring Specification

Wire diameter	mm	4.276
In. dia.	mm	22.0
Free length	mm	45.7
Coil turns		6.5
Effective coil turns		4.5
Spring constant	kg/mm	4.2
Pressed length 1 st	mm/kg	38.5/30.0
Pressed length 2nd	mm/kg	31.0/61.2

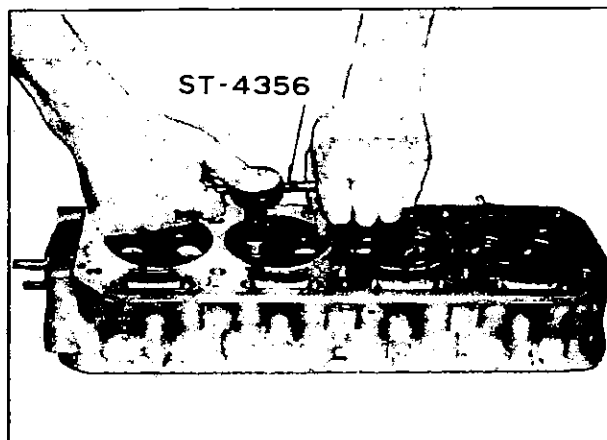


Checking Spring Tension

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Valve Spring & Valve



Turning the Valve Seating Cutter

Valve Grinding

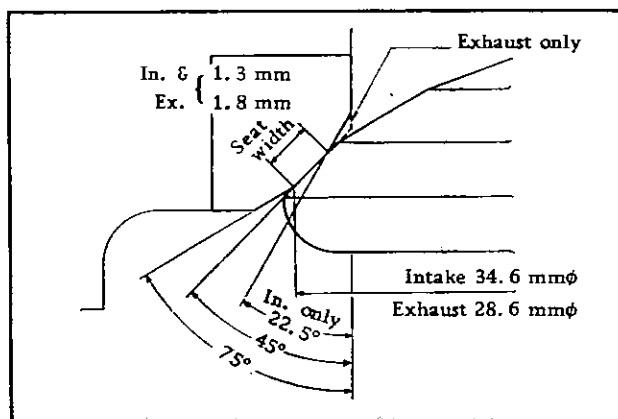
Before replacement of the cylinder head the valves and their seats should be examined for signs of pitting or burnt patches and distortion.

If these conditions are present, the valve seats must be recut before attempting to grind in the valves, whilst distorted valve heads should be trued or the valve renewed. Only the minimum amount of metal should be removed in the turning process.

When grinding a valve onto its seating, the valve face should be smeared lightly with grinding paste and then lapped in with a suction-type grinding tool. The valve must be ground to its seat with a semi rotary motion. A light coil spring interposed between the valve head and the port will assist considerably when lifting the valve in order to rotate the face to a different position. This should be done frequently to spread the grinding compound evenly.

It is necessary to continue the grinding process until an even mat surface is produced on the seating and the valve face.

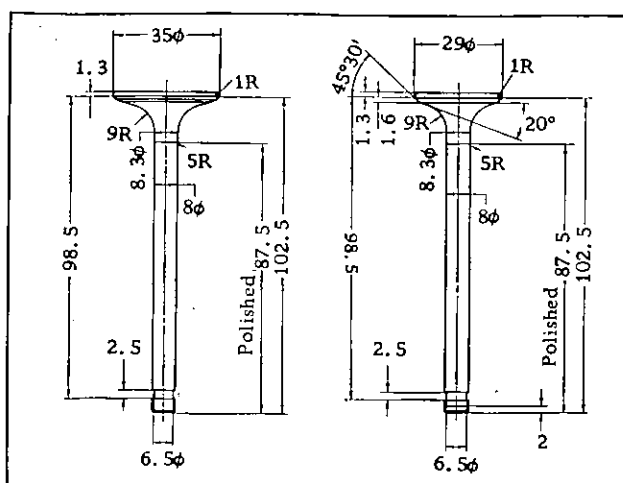
On completion, the valve seats and ports should be thoroughly cleaned with gasoline soaked rag; and dried, and the subjected to a compressed air blast. The valves should be washed in gasoline and all traces of grinding compound removed.



VALVES

Valve head diameter		
Intake valve		35.0 mm
Exhaust valve		29.0 mm
Valve seat width	In. Ex.	1.3 mm 1.8 mm
Valve stem outer diameter (both intake and ex.)		8.7 mmφ (-0.01, -0.02)
Overall length		
Intake valve		109.54 mm
Exhaust valve		108.74 mm

unit: mm

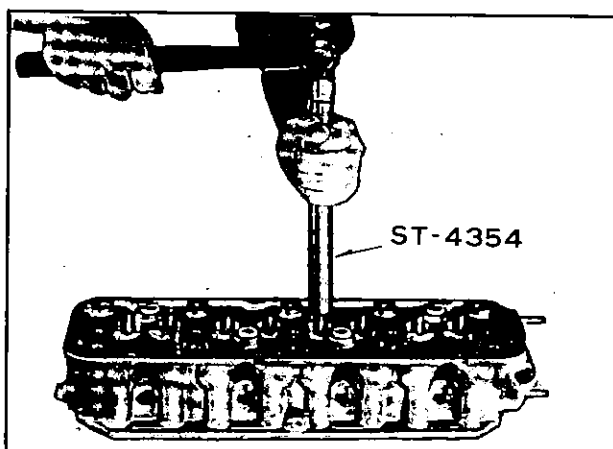


Intake Valve

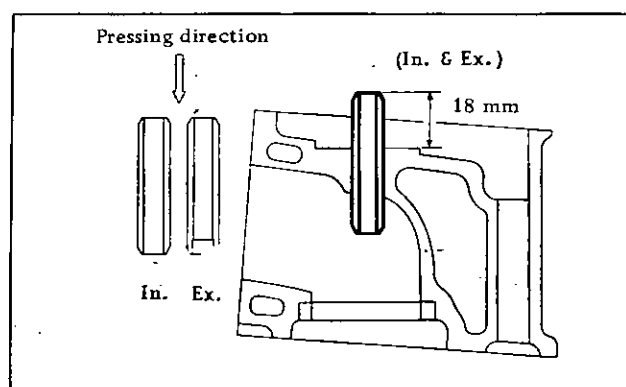
Exhaust Valve

VALVE GUIDE

Removing and Refitting Valve Guide



Fitting position of a valve guide after warming up the cylinder head 200°C.



Location of Valve Guide to be Fixed

		Standard accuracy	Clearance limit
Clearance between valve stem & guide	In.	0.020 ~ 0.040	0.10
	Exh.	0.045 ~ 0.065	

Reamer for guide of cylinder head	
SST No. ST-4355	Finishing dimension
S. T. D.	12φ H6 +0.011 0
O. S.	12.5φ H6 +0.011 0

Valve Guide Service Parts

Standard tight mm		0.025 ~ 0.040
Part No.		Reamer SST NO
In.	13212 18010 O. S.	ST-4355
	13212 18000 S. T. D.	ST-4355
Ex.	13213 18010 O. S.	ST-4355
	13213 18000 S. T. D.	ST-4355

Remove the cylinder head.

Remove the appropriate valve and spring. Reset the cylinder head with its machined face downwards on a clean surface and drive the guide downward into the combustion space with a drift.

This should take the form of hardened steel punch.

When fitting new valve guides, these should be driven in from the top of the cylinder head.

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Removing a Valve Spring in Position

In an emergency a new valve spring can be fitted without removing the cylinder head. When doing this, the applicable piston must be brought to its T.D.C. position to eliminate any possibility of the valve falling into the cylinder.

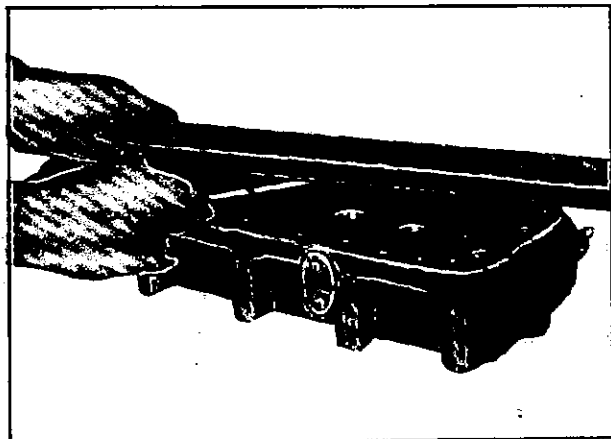
Remove the spark plug from the cylinder concerned. Hold the valve onto its sealing with the aid of a suitable tool such as a bent screwdriver which will pass through the sparking plug orifice, and locate on the valve head. By using the rocker shaft, as a fulcrum point, the spring can be compressed with two screwdrivers or a fork ended bar.

Withdraw the valve cotters and renew the valve spring.

Refitting the Cylinder

Ensure that the cylinder head and cylinder block joint faces are clean.

The cylinder head gasket is marked "Top" so that it will be placed head in correctly.



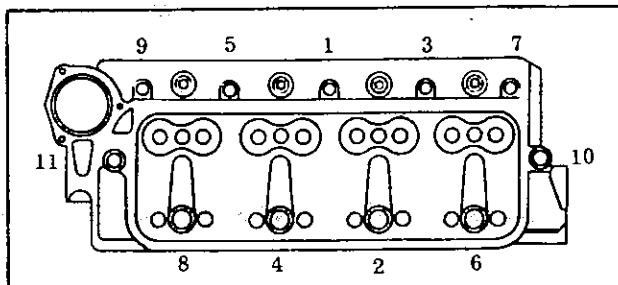
Cylinder Head Distortion Measurement

Place the gasket into position and lower the cylinder head into place. Fit the cylinder head securing nuts finger tight.

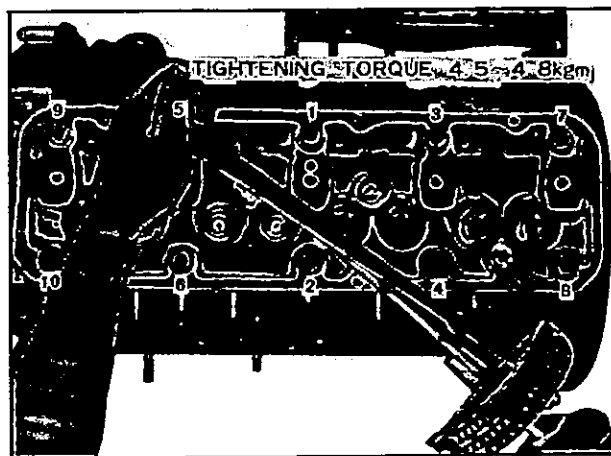
Insert the push rods, replacing them in the positions from which they were taken.

Screw back all the tappet adjusting screws. Replace the rocker assembly and screw down the securing nuts finger tight. Evenly tighten the ten cylinder head bolts a little at a time

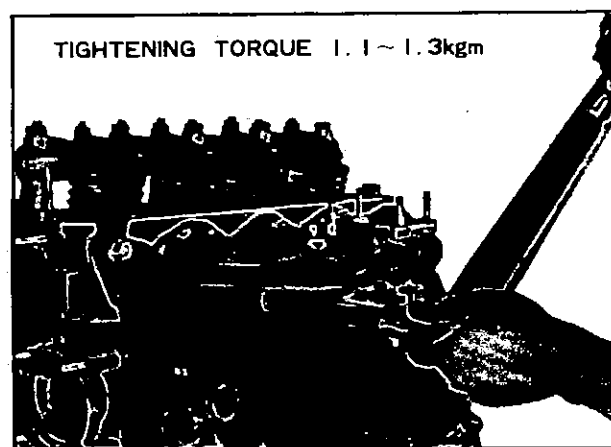
in the order given in Figure, finally pulling them down with a torque wrench set to 4.5 lbs./ft.



The Order of Tightening the Cylinder Head Nuts



Reset the valve clearances, and finally check them when the engine is not hot or cold. The cylinder head bolts may pull down slightly more after the engine has attained its normal working temperature, in which case the valve clearances will have to be checked again and reset if necessary.



Refit the inlet and exhaust manifolds.

Fit the carburetor and reconnect the control linkage. Refit the ignition advance suction pipe to the connection on the carburetor, but do not at this stage refit the air cleaner or it will have to be removed later to check the valve clearances. Replace the rocker cover taking care to fit the cork gasket correctly.

Place the thermostat and its housing in position and secure with the three nuts.

Reconnect the water temperature gauge wire and fit the radiator hose to the thermostat housing. Connect the cables to the battery. Ensure that the radiator and cylinder block drain tapes are closed, and refill the radiator.

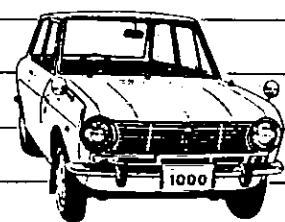
Clean and adjust the sparking plugs and refit them, clipping on the high tension leads. The firing order of the engine is 1-3-4-2. Replace the clip which secures part of the electrical wiring harness to the side of the head.

The ignition can now be switched on and the engine started. When the normal operating temperature has been reached switch off and remove the rocker cover so that the valve clearances may be rechecked. Replace the rocker cover and fit the air cleaner when the final check has been made.

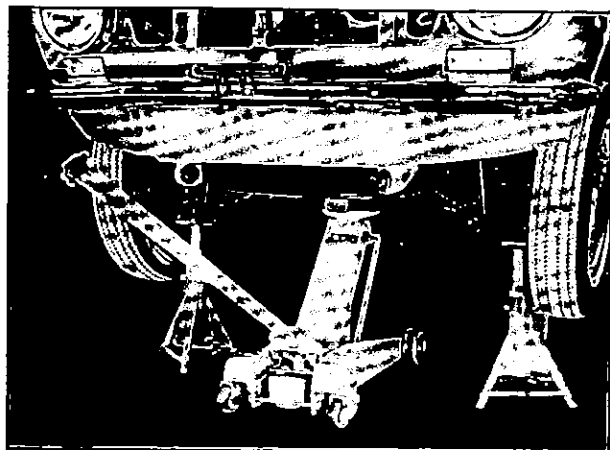
Whilst the engine is running check that the water hose connections and fuel line unions do not leak. Tighten them if necessary.



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REMOVING & REFITTING



Experience has shown that it is much easier to remove the engine and transmission as a single unit than to detach the engine by itself.

To remove the engine and transmission upwards, proceed as follows;

Completely drain the cooling system and the transmission, disconnect and remove the battery and its supporting tray.

Remove the upper and lower radiator hoses by undoing the retaining clips.

Disconnect the capacitor lead at the distributor, also the high tension and switch wires at the coil.

Take off the dynamo lead and disconnect the starter motor cable at the motor end.

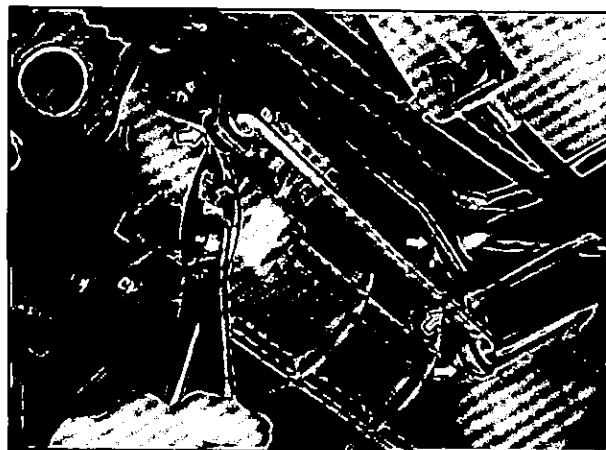
Remove the oil gauge and water, temperature gauge leads from their terminals on the engine.

The throttle and choke controls must be disconnected from the carburetor. Disconnect the fuel pipe from the fuel pump.

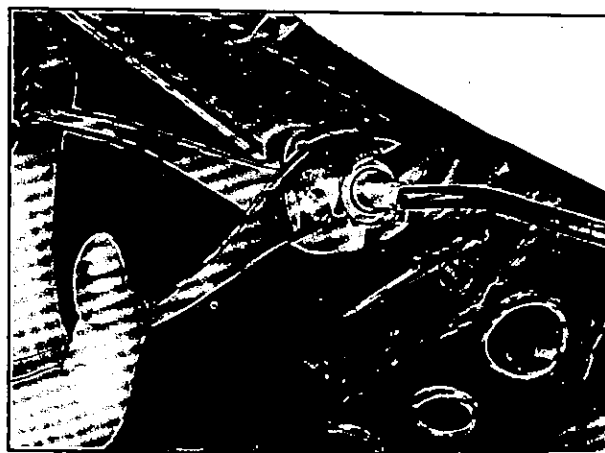
Next, remove the exhaust pipe from the manifold.

From below the vehicle, remove the gear change selector rod from the lever on the transmission casing.

Disconnect the earth strap from the starter motor. Remove the hand brake control rod supporting from transmission.



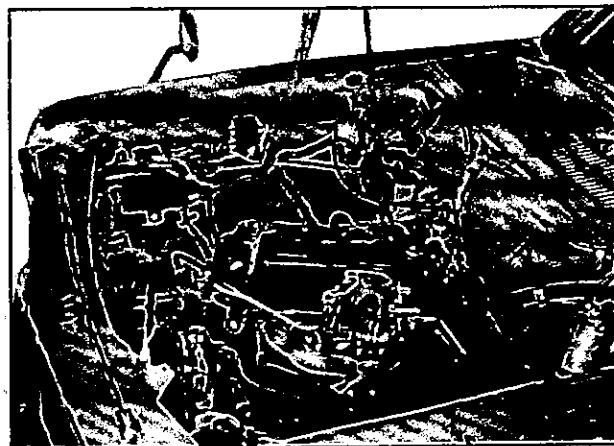
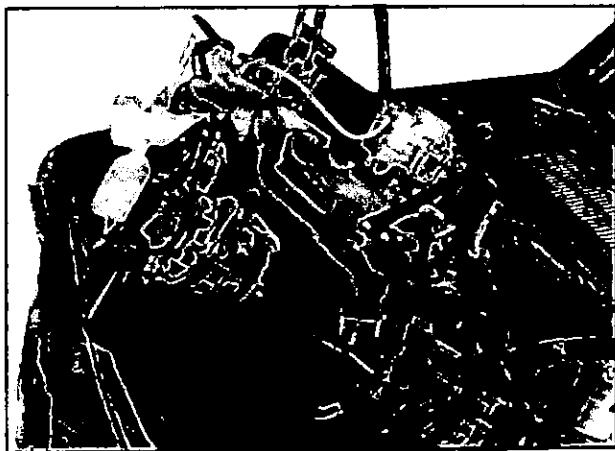
Disconnect the speedometer cable from the transmission.



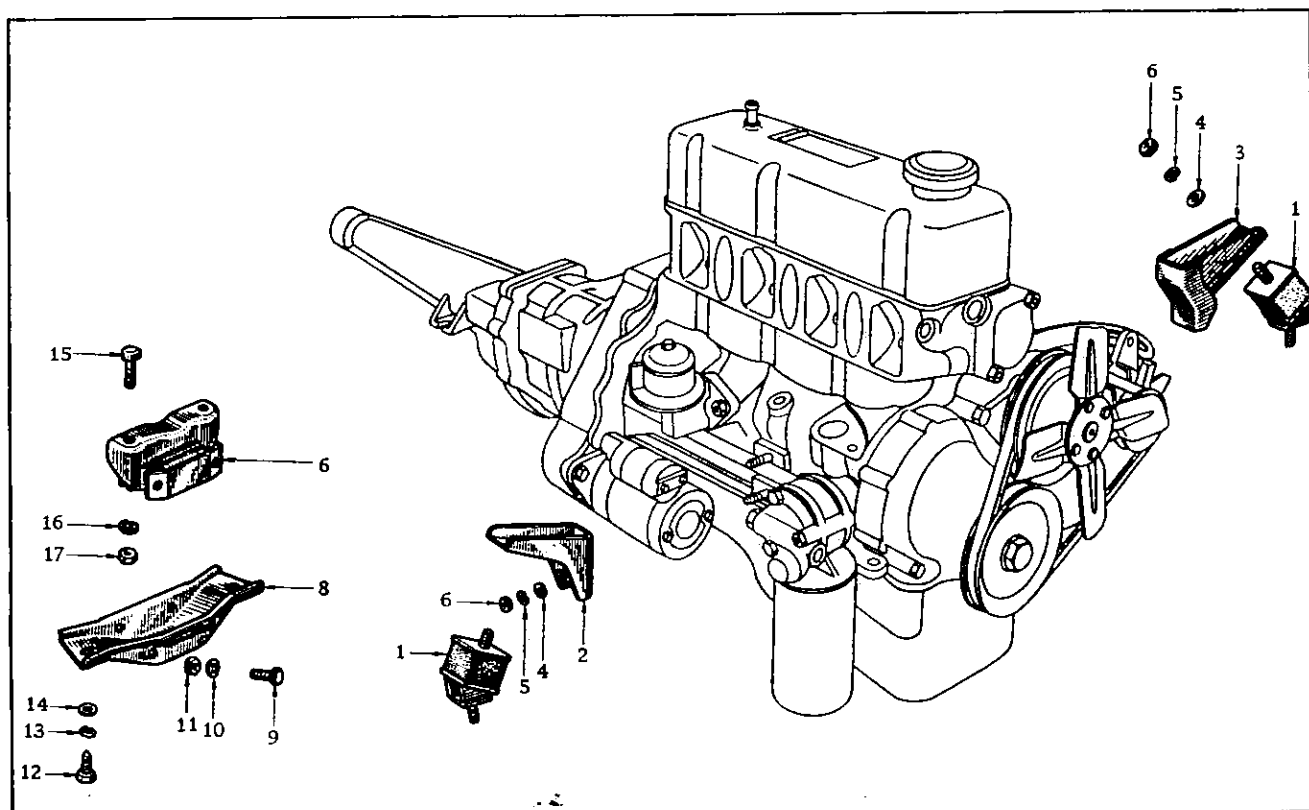
Uncouple the propeller shaft pinion franges at rear axle and draw the shaft out of the transmission.



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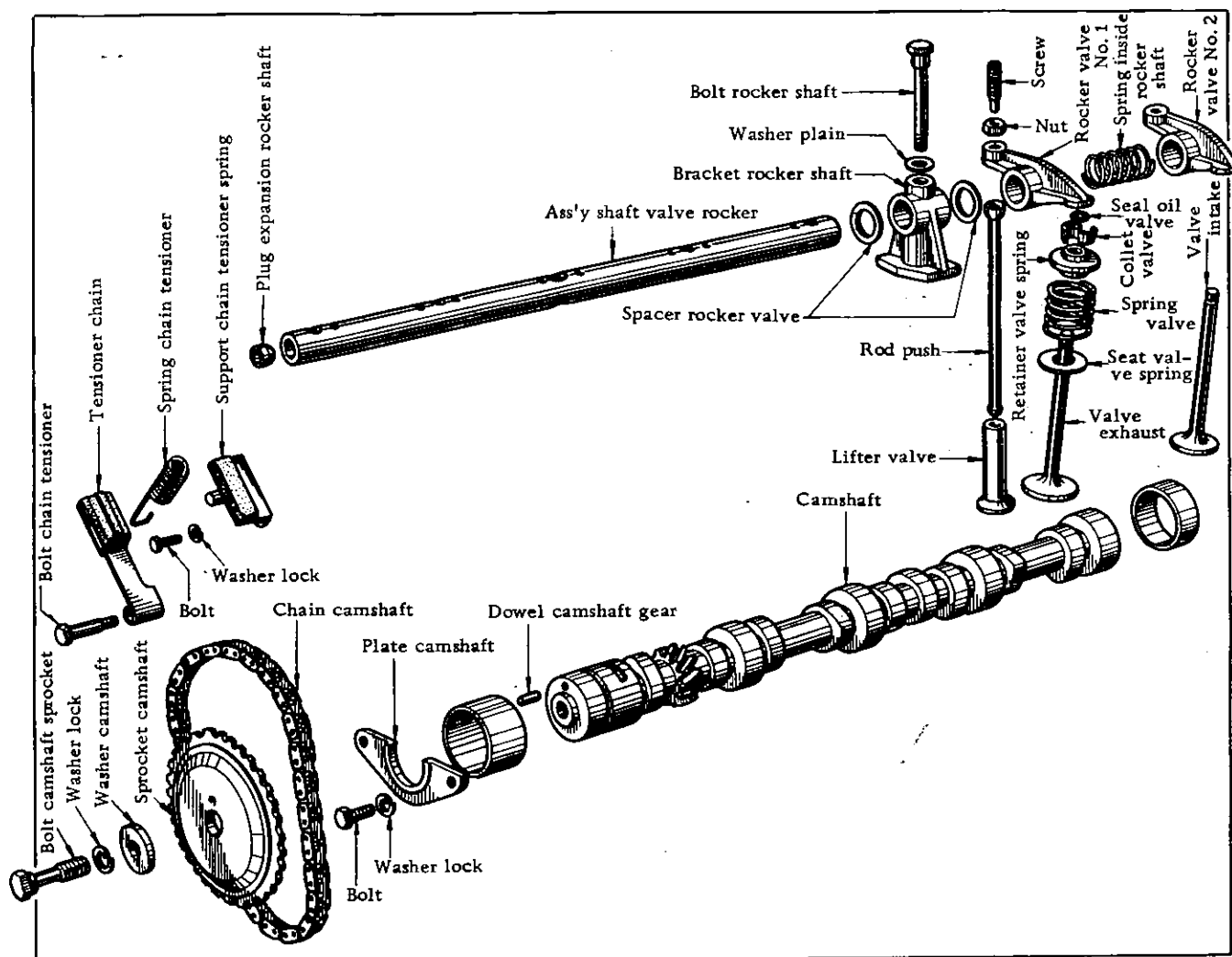


OPERATION WITH THE ENGINE REMOVED

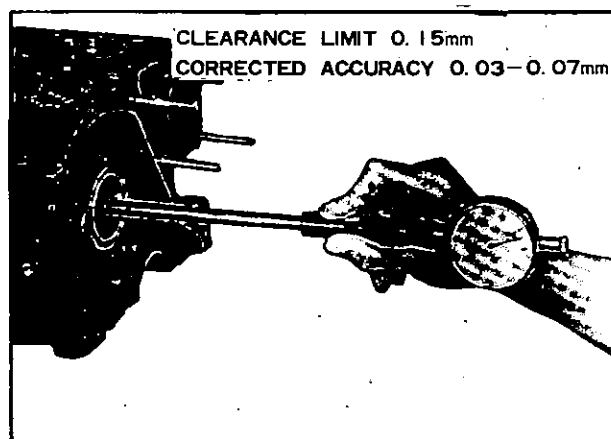
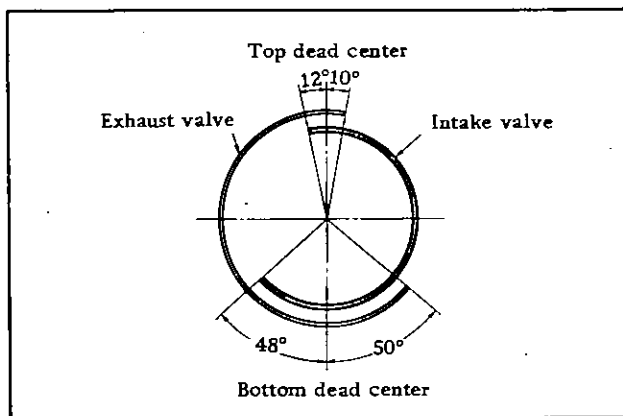


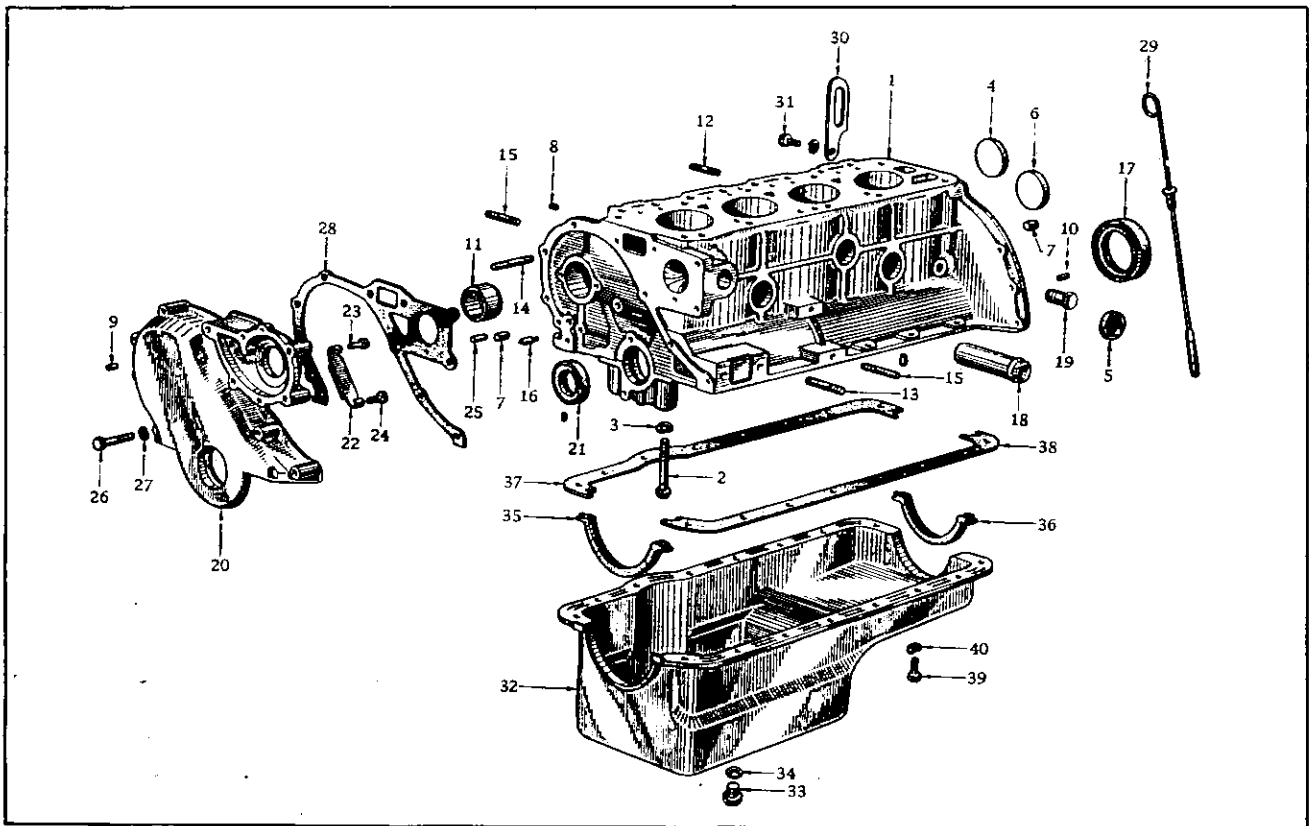
Engine Mounting

1	Insulator-engine mounting front	7	Ass'y-insulator, engine mounting rear	13	Washer-lock
2	Bracket-engine mounting front (R. H)	8	Member-engine mounting rear	14	Washer-plain
3	Bracket-engine mounting front (L. H)	9	Bolt	15	Bolt
4	Washer-plain	10	Washer-lock	16	Washer-lock
5	Washer-lock	11	Nut	17	Nut
6	Nut	12	Bolt		



Camshaft & Valve Mechanism





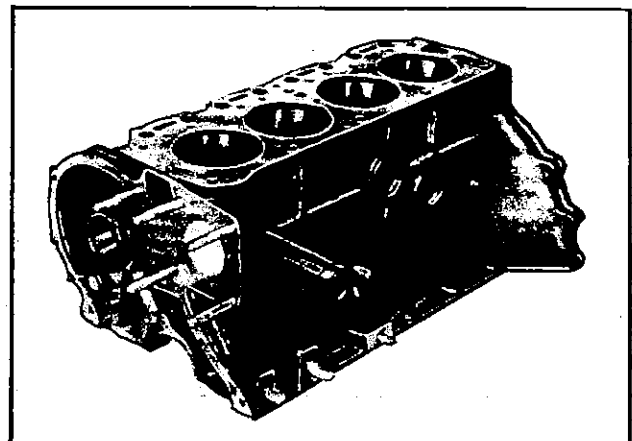
Cylinder Block

1	Ass'y-block, cylinder	15	Stud	28	Gasket-timing chain cover
2	Bolt	16	Jet-oil, timing chain	29	Gauge-oil level
3	Washer-lock	17	Seal-oil, crank shaft rear	30	Slinger-engine front
4	Plug-taper	18	Pipe-suction	31	Bolt
5	Plug-taper	19	Plug-water drain	32	Ass'y-oil pan
6	Plug-taper	20	Ass'y-cover, timing chain	33	Plug-drain
7	Plug-crank case oil gallery	21	Seal-oil, crank shaft front	34	Gasket-drain plug
8	Plug-blind	22	Tensioner-chain, tension side	35	Seal-oil, oil pan front
9	Dowel-timing chain cover	23	Support-tensioner, tension side	36	Seal-oil, oil pan rear
10	Dowel-timing chain locating	24	Bolt	37	Gasket-oil pan (R.H)
11	Set-bushing, camshaft	25	Dowel-water pump	38	Gasket-oil pan (L.H)
12	Stud	26	Bolt	39	Bolt
13	Stud	27	Washer-lock	40	Washer-lock
14	Stud				

Cylinder Block

The cylinder block made of special cast iron has sufficient rigidity despite its compact and light construction.

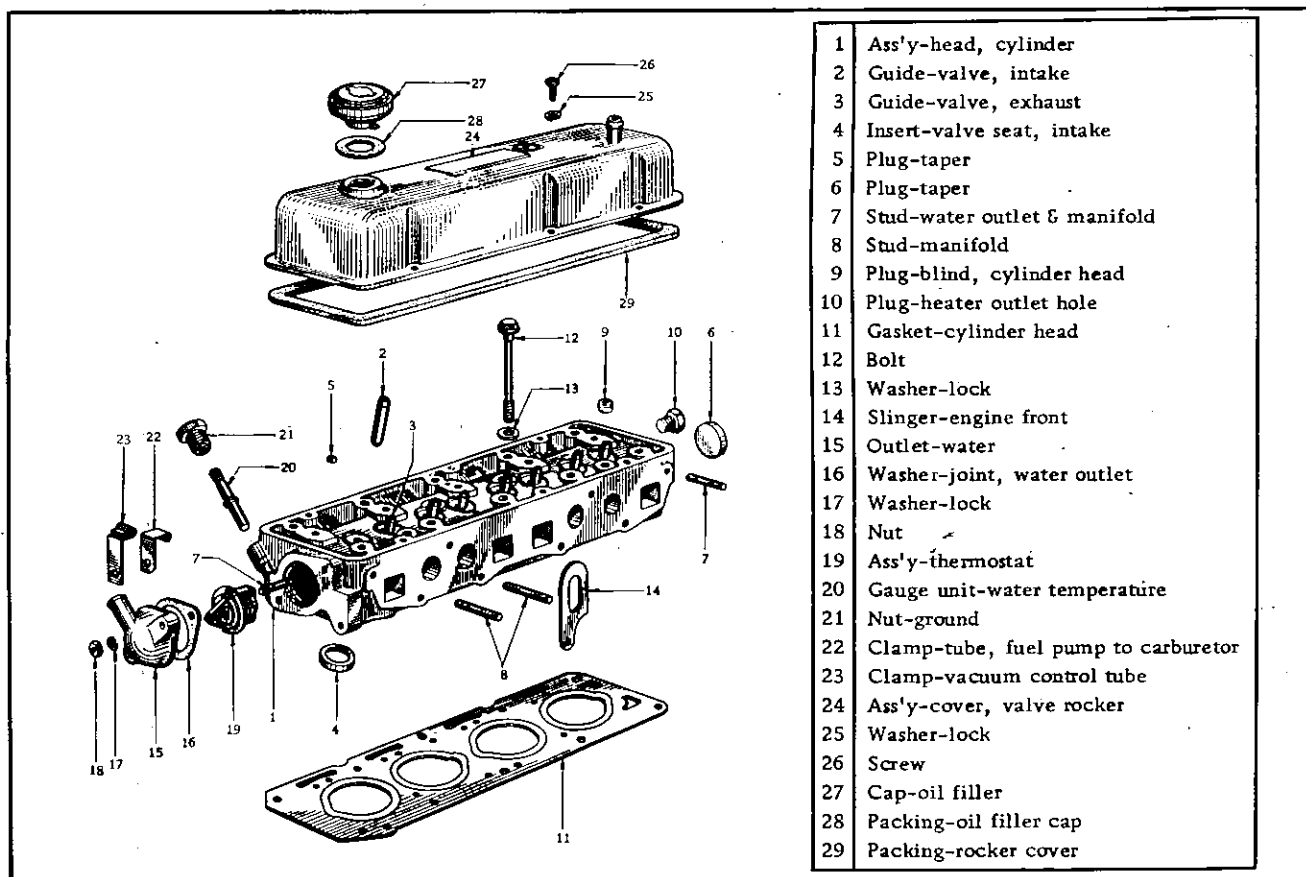
The flange is provided at the rear side of the cylinder block to connect with the transmission directly.



Camshaft

Clearance	0.03 - 0.07 mm
Limit of bent	0.05 mm
Camshaft bore in crankcase --- out of roundness	Less than 0.03 mm
End play	0.02 - 0.08 mm
Cam height (Intake and exhaust)	36.45 - 36.55 mm
Wear limit of cam height	0.5 mm

Size	Camshaft Lapped Dimension mm (Bushing Part No.)				
	No. 1 (front)	No. 2	No. 3 (center)	No. 4	No. 5 (rear)
S.T.D.	43.793-43.806 (13005-18001)	43.283-43.296 (13006-18001)	42.783-42.796 (13007-18001)	42.283-42.296 (13008-18001)	41.218-41.231 (13009-18001)
U.S. 0.25	43.543-43.556 (13005-18002)	43.033-43.046 (13006-18002)	42.533-42.546 (13007-18002)	42.033-42.246 (13008-18002)	40.968-40.981 (13009-18002)
U.S. 0.50	43.293-43.306 (13005-18003)	42.783-42.796 (13006-18003)	42.283-42.296 (13007-18003)	41.783-41.796 (13008-18003)	40.718-40.731 (13009-18003)
U.S. 0.75	43.043-43.056 (13005-18004)	42.533-42.546 (13006-18004)	42.033-42.046 (13007-18004)	41.533-41.546 (13008-18004)	40.468-40.481 (13009-18004)



Cylinder Head

Removing and Replacing the Tappets

Remove the carburetor and the rocker cover, then take off the manifolds.

Disconnect the high-tension leads sparking plugs, remove the rocker assembly and withdraw the push rods, keeping them in their respective positions.

To remove the tappet, pull out the tappets from the side of camshaft when drawing out the camshaft, also keeping them in same locations.

New tappet should be fitted by selective assembly so that they fall into the guides under their own weight when lubricated.

Assembly is a reversal of the above procedure, but care should be taken to see that the rockers are adjusted to give the correct valve clearance.

Piston and Connecting Rod Removal

Drain the cooling water from the engine and radiator. Drain and remove the sump from the engine, then disconnect and remove the oil strainer. Take out the setscrews and rock

washers from the big-ends and withdraw the caps. It will be noted that the caps are off-set; When used parts are replaced after dismantling it is essential they are fitted into their original positions. To ensure correct refitting mark the caps and connecting rods on the sides to identify them together. The piston and connecting rods must be withdrawn upwards through the cylinder bores.

Release the connecting rod from the crankshaft and slowly push the piston and rod upwards through the cylinder bore.

NOTE:

It may be necessary to remove the ring of carbon or lip from the top of the cylinder bore with a hand scraper to avoid risk of piston ring breakage.

Remove the assembly from the top of the cylinder block.

Check the crankpins for oval with a pair of micro meter calipers, and examine the bearing surface for scoring, either defect will necessitate the removal of the crankshaft for regrounding.

CONNECTING ROD

Difference in weights of
connecting rods in one
engine Less than 5 gr.

Limit of bent or twist .. 0.05 mm

Side clearance 0.2 - 0.3 mm

Connecting rod bearing
clearance 0.01 - 0.05 mm

Crank pin bore
diameter 44.961 - 44.974 mm

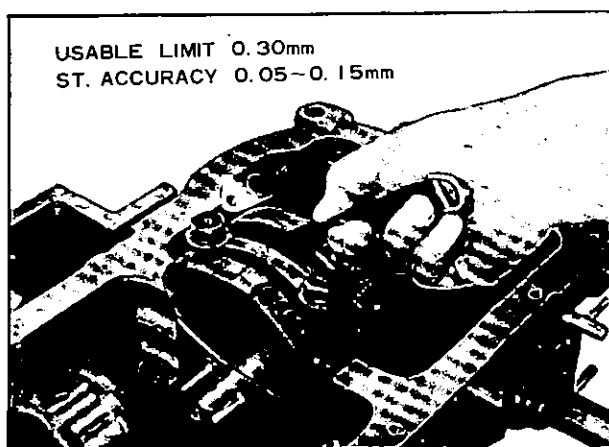


Removing Connecting Rod with Piston

Connecting Rod Bushing (for replacement)

Part No. & Size	Bushing Thickness	Lapped dia. of Crankpin
12111-18000 S.T.D.	1.500-1.508 mm	44.961-44.974 mm
12111-18001 U.S. 0.08	1.540-1.548 mm	44.881-44.984 mm
12111-18002 U.S. 0.12	1.560-1.568 mm	44.841-44.854 mm
12111-18003 U.S. 0.25	1.625-1.633 mm	44.711-44.724 mm
12111-18004 U.S. 0.50	1.750-1.758 mm	44.461-44.473 mm
12111-18005 U.S. 0.75	1.875-1.883 mm	44.211-44.224 mm
12111-18006 U.S. 1.00	2.000-2.008 mm	43.961-43.874 mm

CRANKSHAFT



Main bearing journal

--- out of round Less than 0.03 mm

Crankpin --- out of round Less than 0.03 mm

Limit of bent Less than 0.05 mm

Crankshaft/main bearing --- end play . 0.05 - 0.15 mm

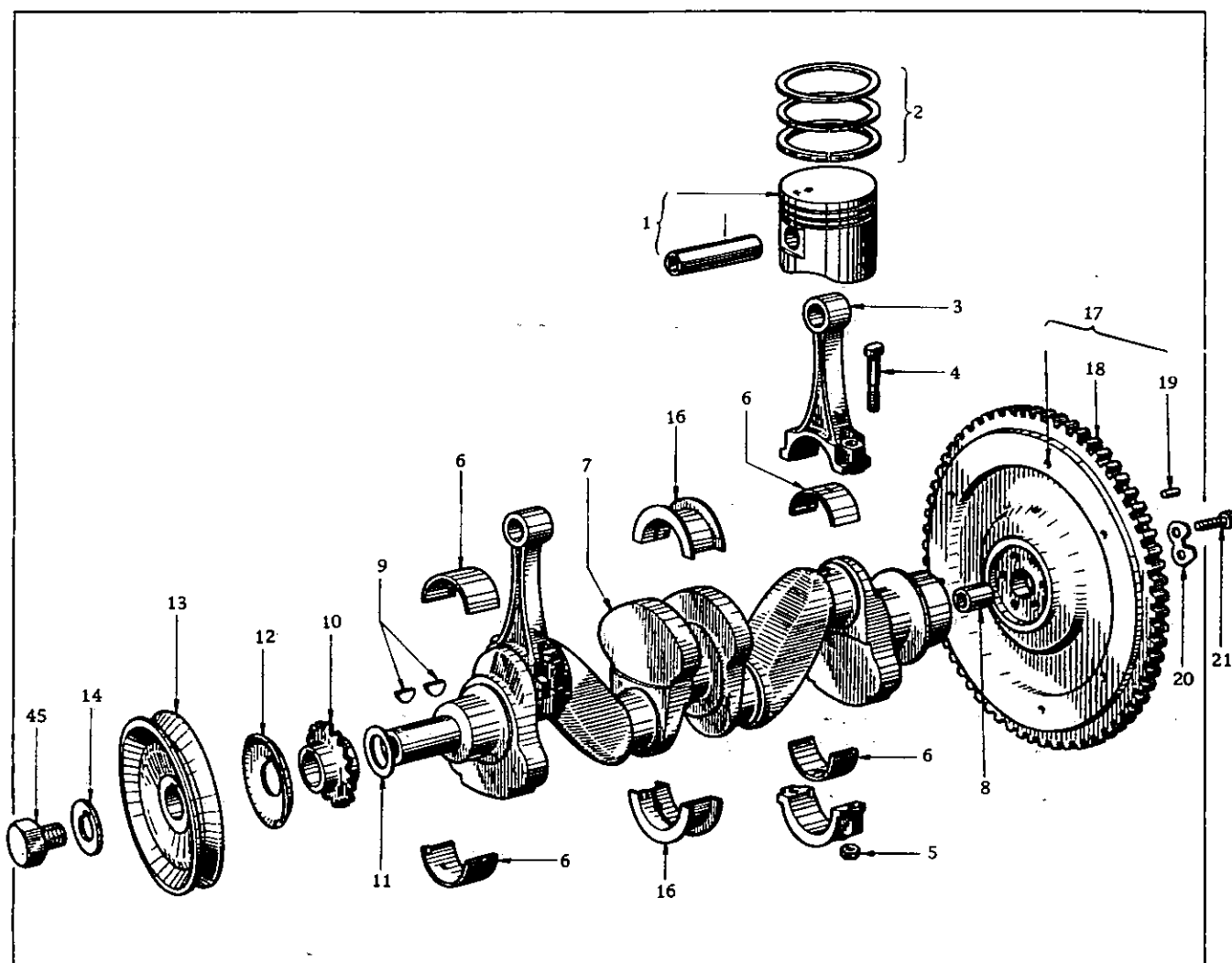
Bearing clearance limit 0.1 mm

Main Bearing Bushing (for replacement)

Part No. & Size	Bushing Thickness	Lapped Dia. of Journal
12215-18000 (front & rear) S.T.D. 12247-18000 (center)	1.827-1.835 mm	49.951-49.961 mm
12215-18001 (front & rear) U.S. 0.25 12247-18001 (center)	1.952-1.960 mm	49.701-49.714 mm
12215-18002 (front & rear) U.S. 0.50 12247-18002 (center)	2.077-2.085 mm	49.451-49.464 mm
12215-18003 (front & rear) U.S. 0.75 12247-18003 (center)	2.202-2.210 mm	49.201-49.214 mm
12215-18004 (front & rear) U.S. 1.00 12247-18004 (center)	2.327-2.335 mm	48.951-48.964 mm

The shell bearing are removable by hand. The bearings are require no "bending in" it is being only necessary to ensure that the housings are scrupulously clean and dry, and to place the bearings into position with the tangs located in their corresponding slots. Always renew bear-

ings if they are scored or damaged in any way, or following the regrinding of the crankshaft bearings will be required and the kinds of sizes available are -8, -12, -25, -50, -75 and -100 (with punched mark).



Piston & Crank Shaft

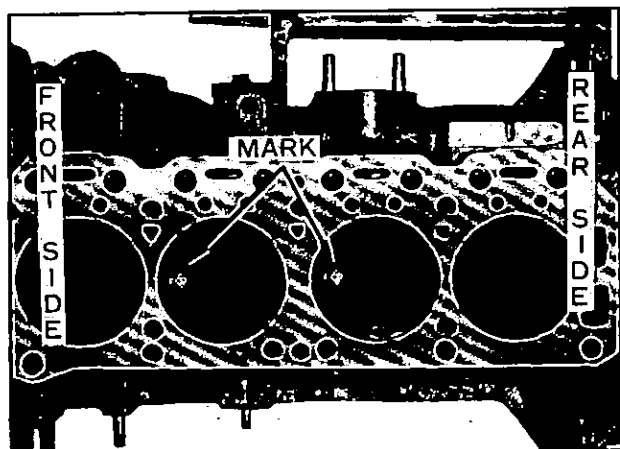
1	Set-piston, with piston pin	12	Thrower-oil, crank shaft
2	Set-ring, piston	13	Pulley-crank shaft
3	Ass'y-rod, connecting	14	Washer-lock, pulley bolt
4	Bolt-connecting rod	15	Bolt-crank pulley
5	Nut	16	Set-bushing, main bearing
6	Bushing-connecting rod	17	Ass'y-flywheel
7	Ass'y-crank shaft	18	Gear-ring, flywheel
8	Bushing-pilot	19	Dowel-flywheel
9	Key-woodruff	20	Washer-flywheel
10	Sprocket-crank shaft	21	Bolt-flywheel
11	Washer-packing, crank shaft		

PISTON

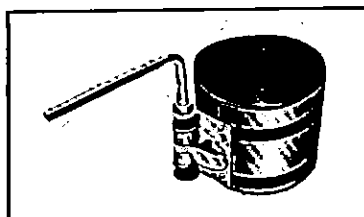
Replacing Pistons and Connecting Rods

Insert each piston and connecting rod assembly into the cylinder from which it was taken; it is essential that the split in the skirt of the piston is positioned towards the camshaft.

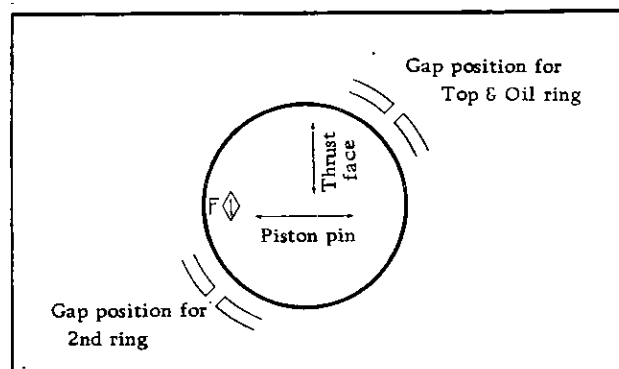
Compress the piston rings with inserting piston using tool, and gently tap the crown of the piston with the wooden end of a hammer handle, until the piston is clear of the piston ring clamp.



Inserting the Piston

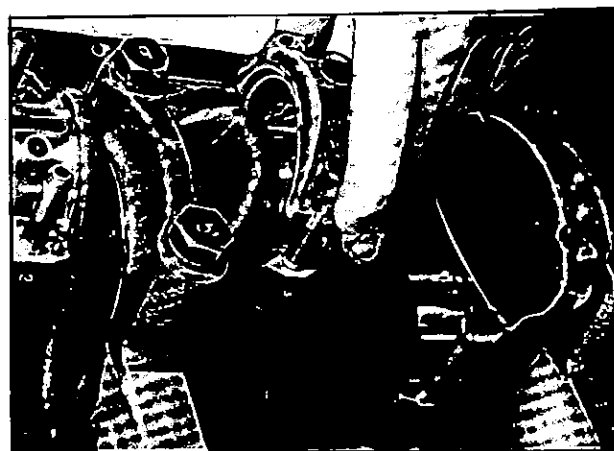


Piston Adaptor



Direction of Ring Gap

Now push the piston down the cylinder-block until the big end of the connecting rod just protrudes through the bottom of the cylinder bore, then position upper half bearing shells.



Bushing of Connecting Rod (service parts)

Part No. & Size	Thickness of Bushing	Finished Dimension of Crankpin
12111-18000 S.T.D.	1.500-1.508 mm	44.961-44.974 mm
12111-18001 U.S. 0.08	1.540-1.548 mm	44.881-44.894 mm
12111-18002 U.S. 0.12	1.560-1.568 mm	44.841-44.854 mm
12111-18003 U.S. 0.25	1.625-1.633 mm	44.711-44.724 mm
12111-18004 U.S. 0.50	1.750-1.758 mm	44.461-44.474 mm
12111-18005 U.S. 0.75	1.875-1.883 mm	44.211-44.224 mm
12111-18006 U.S. 1.00	2.000-2.008 mm	43.961-43.974 mm

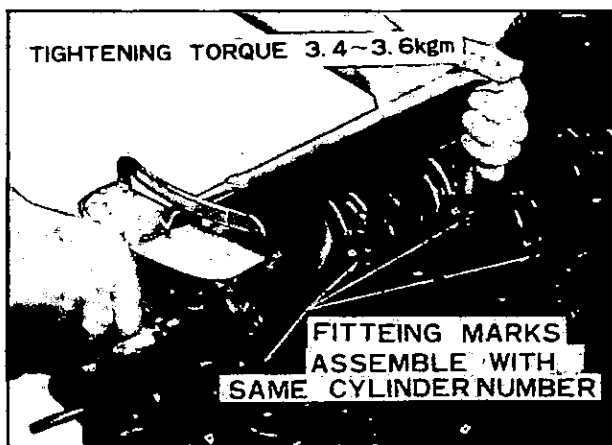
DATSUN 1000

NOTE:

Each upper and lower bearing has two oil holes, there by ensuring sufficient and it is of the greatest importance that the corresponding oil hole in the bearing shell registers with the oilway to provide an unobstructed passage.

Pull the connecting rod onto the crankpin taking the shell into the connecting rod cap; position the cap and the locking washers.

Insert the setscrews and tighten with a torque wrench to 3.4 ~ 3.6 kg-m.



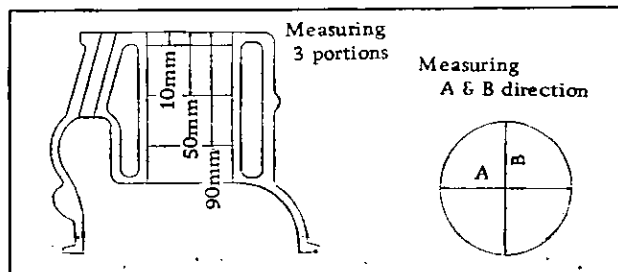
Measuring Thrust Clearance of Connecting Rod

Finally knock back the lock washers.

Check the connecting rod big end for side clearance (0.4 mm) and see that the shell bearings are not binding on the crankpin when rotating the crankshaft. If it is difficult to turn, undo the big end and examine the shell and seat for dirt or grit.

Before reassembling always apply a little clean oil to the piston surfaces and into the cylinder bore. Never file the connecting rod caps or their mating surfaces as this creates oval in the bearing.

Removing a Piston



Measuring for Bore Size

Remove the pin from the small end of the connecting rod and press out the gudgeon pin. The gudgeon pin is press fit in piston.

unit : mm

		Correctional accuracy	Wear limit
Inner dia.		+0.05 0	0.2
Allowable error of cyl. inner dia.	Elips	0.015	-
	Taper	within 0.020	-
Difference of inner dia., each cyl.		within 0.05	-

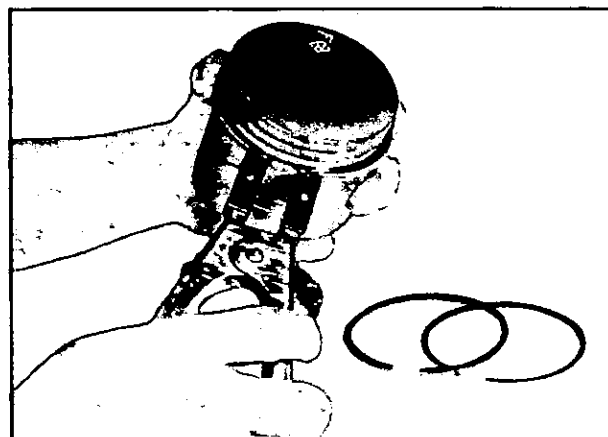
Piston Over Size

Over Size	Part No.
S. T. D.	12012 18000
OS 0.25	12013 18000
OS 0.50	12014 18000
OS 0.75	12015 18000
OS 1.00	12016 18000
OS 1.25	12017 18000
OS 1.50	12018 18000

Piston and Bores

Insert "Feeler gauge", 0.03 mm thick, between cylinder bore and piston, and measure at the lower portion of the cylinder bore at right angle to the piston pin.

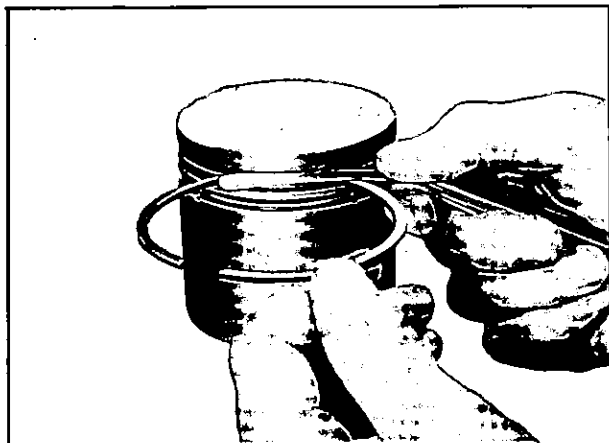
Pull out with feeler gauge by the spring scale and then inspect if the reading is within regulations (0.5-1.5 kg) or not.



Removing Piston Ring

Piston Rings

The piston ring gap should be within 1.0 mm when checked in the cylinder bore. The clearance of the compression rings in their grooves should amount to 0.20 mm and the oil control ring 0.041-0.092 mm.



Because the piston rings do not travel to the end of the cylinder bores a "lip" is eventually formed due to wear.

This may be checked with a dial gauge and must be removed. If this is not done there will be a tendency to noisy operation or a fractured ring, caused by the top piston ring striking the lip.

unit: mm

		Standard accuracy	Clearance limit
Clearance between Groove & ring	Top	0.04 ~ 0.07	0.20
	Second	0.04 ~ 0.07	0.20
	Oil	0.04 ~ 0.08	0.20
Clearance between Pin hole & pin		0.003T 0.009L	0.02

Clearance Between Ring and Groove



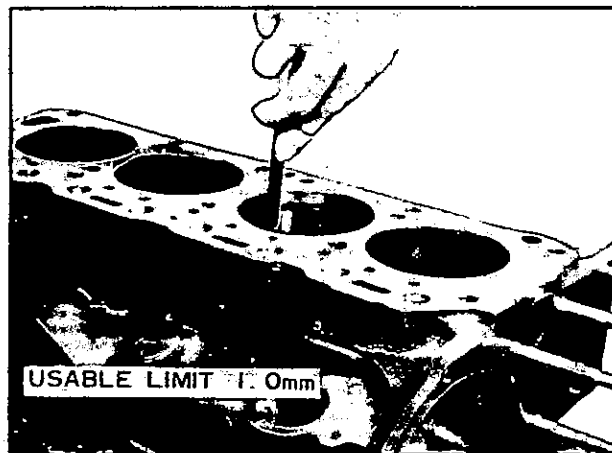
Piston & Piston Ring

Compression rings --- side clearance	0.04 - 0.07 mm
Oil ring --- side clearance	0.04 - 0.08 mm
End gap of both compression and oil rings	0.2 - 0.3 mm
Piston/piston pin --- press-fit	
(with set)	1.0 - 1.5 t

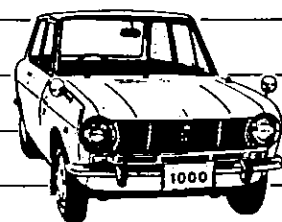
O.S.	Set Piston with Piston pin	Upper	Piston Ring Lower	Oil
S.T.D.	12012-18000	12041-13200	12043-30000	12046-30800
O.S. - 0.25	12013-18000	12042-13200	12044-30000	12047-30801
O.S. - 0.50	12014-18000	12042-13201	12044-30001	12047-30802
O.S. - 0.75	12015-18000	12042-13202	12044-30002	12047-30803
O.S. - 1.00	12016-18000	12042-13203	12044-30003	12047-30804
O.S. - 1.25	12017-18000	12042-13204	12044-30004	12047-30805
O.S. - 1.50	12018-18000	12042-13205	12044-30005	12047-30806

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Piston and rings are available in 0.25 mm, 0.50 mm, 0.75 mm, 1.00 mm and 1.50 mm oversizes. The piston rings should always be fitted from the crown of the piston and never pushed upwards over the skirt. Before fitting the rings, remove any carbon deposit from the grooves in the piston. When fitting, note that the second compression is tapered type and oil control ring is slat type processed by chromium plating.

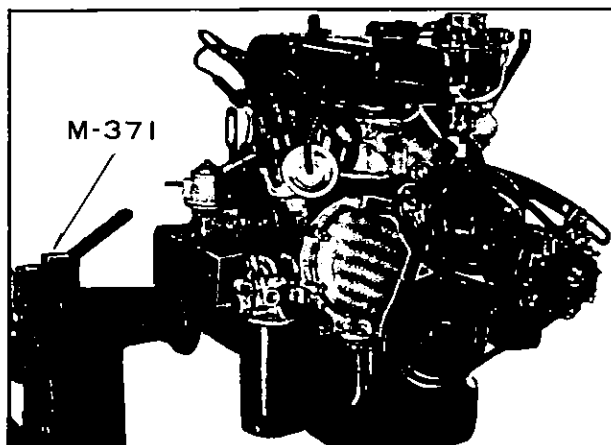


Measuring Clearance of Ring Joint

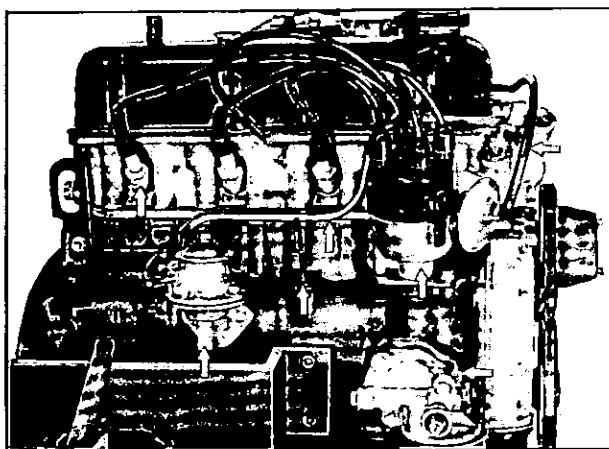


The following operations are best performed with the engine removed from the car.

Although it may be found possible to carry out certain attentions with the engine in position, it is more convenient to do the work on the bench.



Removing Crank Gear, Cam Gear and Chain



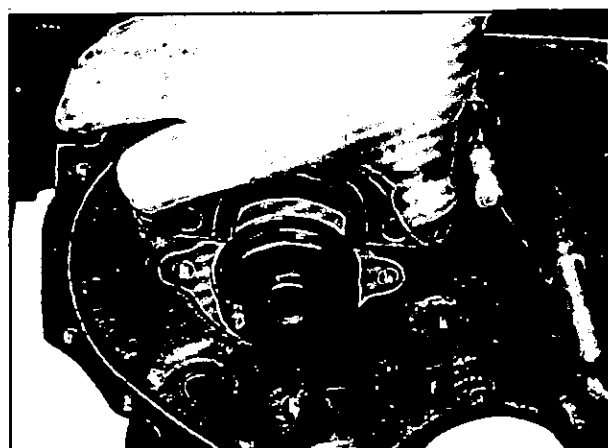
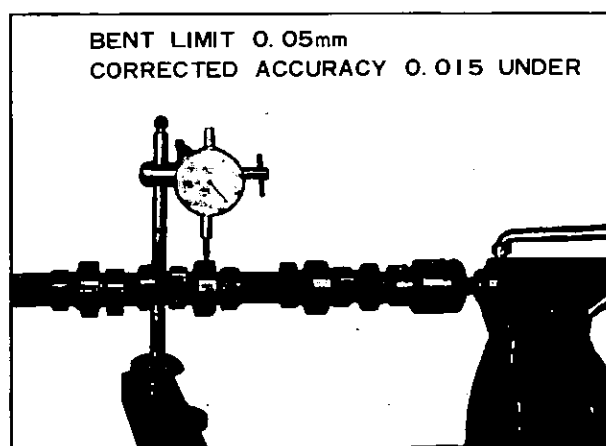
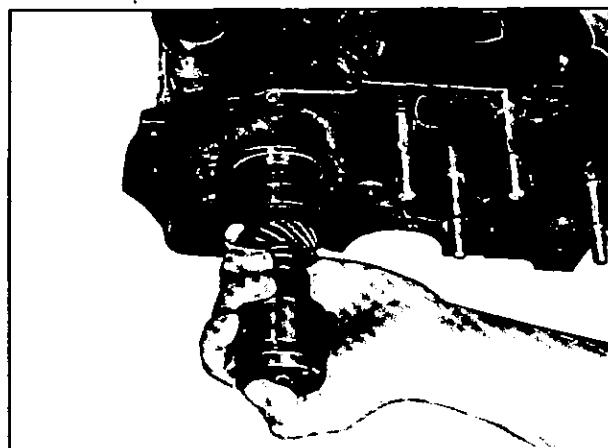
Withdrawing Camshaft

The camshaft is positioned by a locating plate held by three screws and shakeproof washers. Note the position of the small lubricating oil hole in the locating plate when replacing should be to the right of the engine.

End play of 0.1 ~ 0.2 mm is controlled by the thickness of the locating plate, and can be checked with a dial indicator set against the camshaft gear.

Before withdrawing the camshaft, the distributor driving spindle will have to be removed.

Remove the valve lifter, the oil pump and its drive shaft. Take off the timing cover and gears.



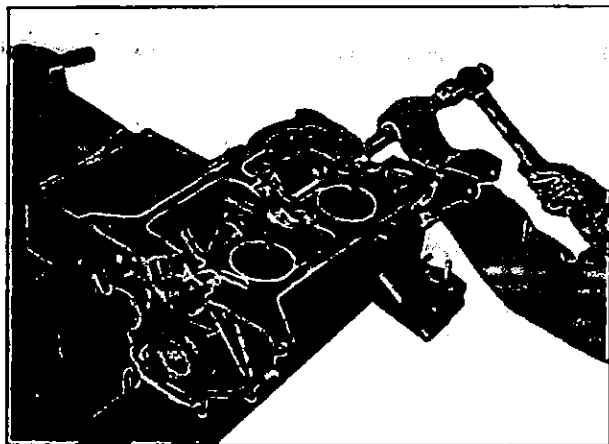
Take out the setscrews securing the camshaft locating plate, when the camshaft can be withdrawn from the cylinder block.

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Camshaft Bearings

White metal bearings, with steel lining are used for the camshaft. They can be taken out renewed when necessary, it being usual to do this when the cylinder block is being reconditioned.

The bearings can be removed by drifting them out of their housings.



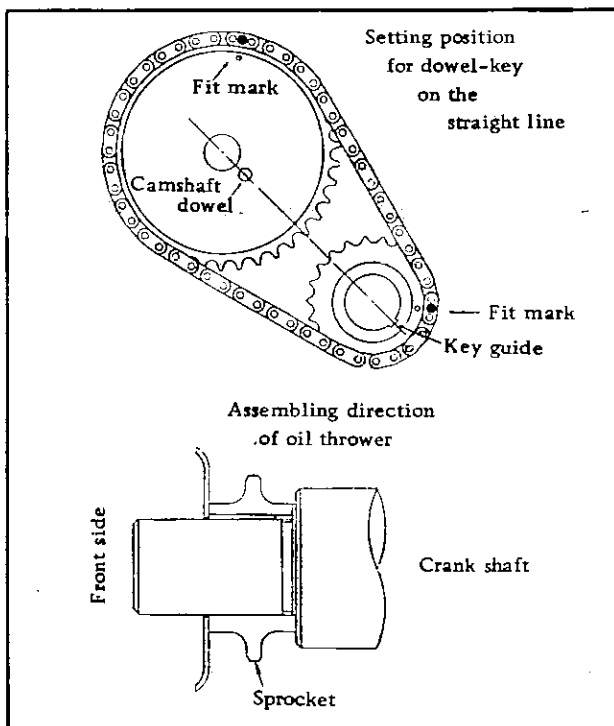
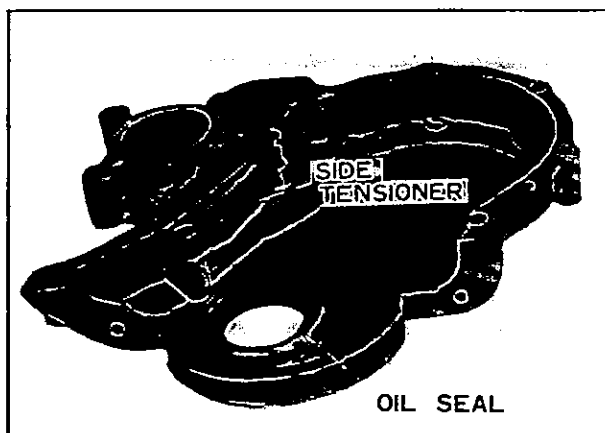
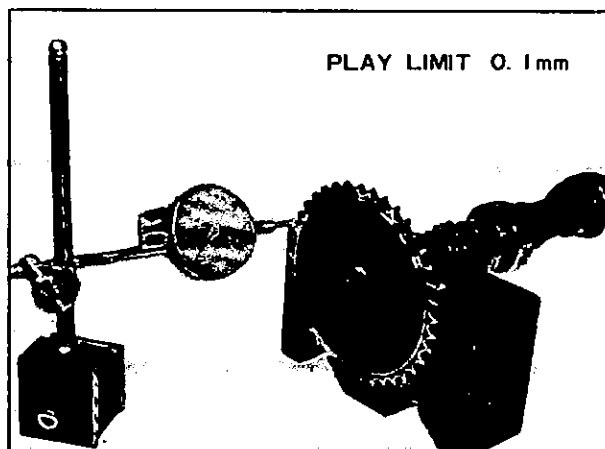
When fitting new bearings care must be taken to line up the oil holes with the corresponding holes in the cylinder block.

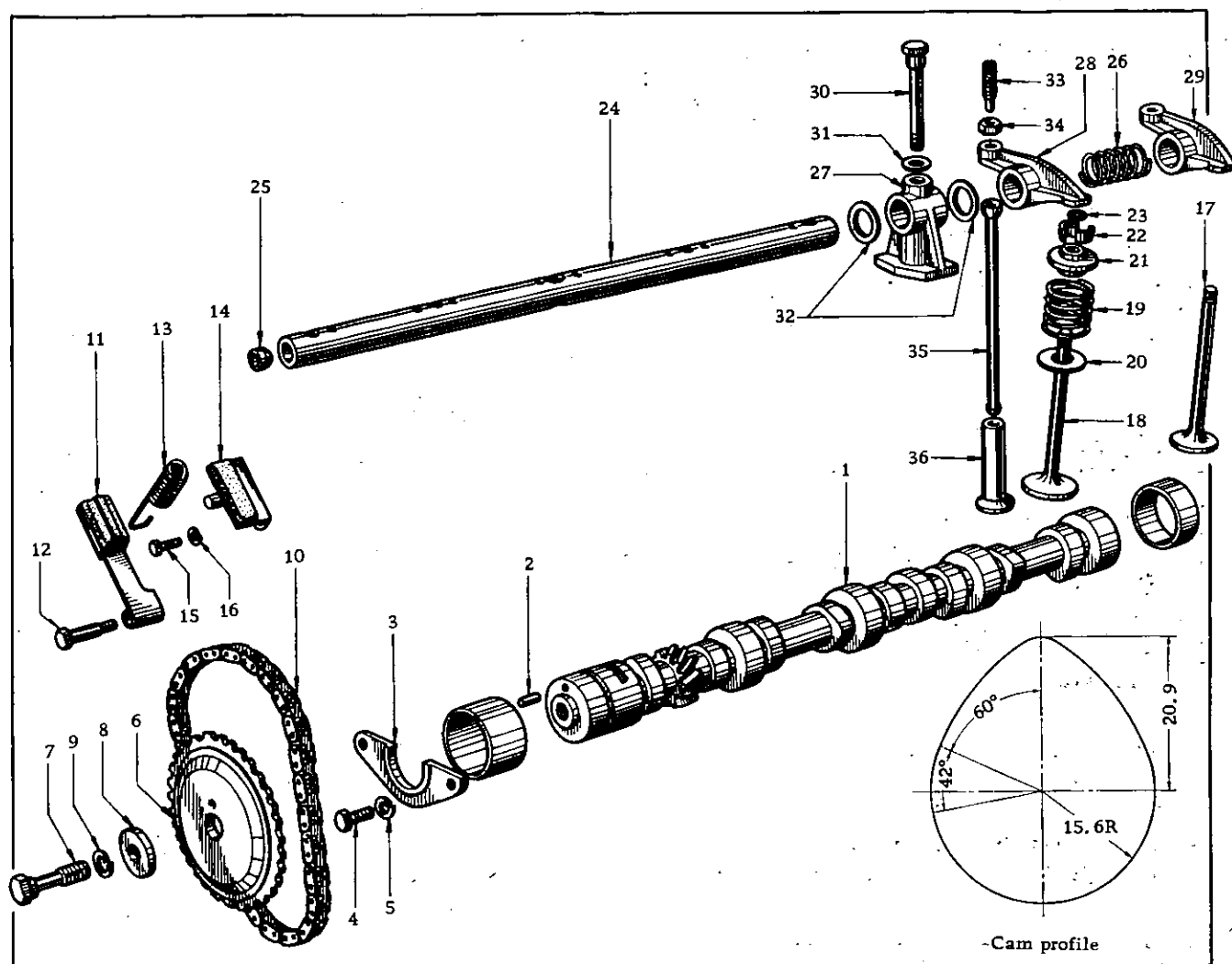
Tap the new bearings into position and ream them to give a running clearance of 0.1 ~ 0.2 mm.



Refitting the Camshaft

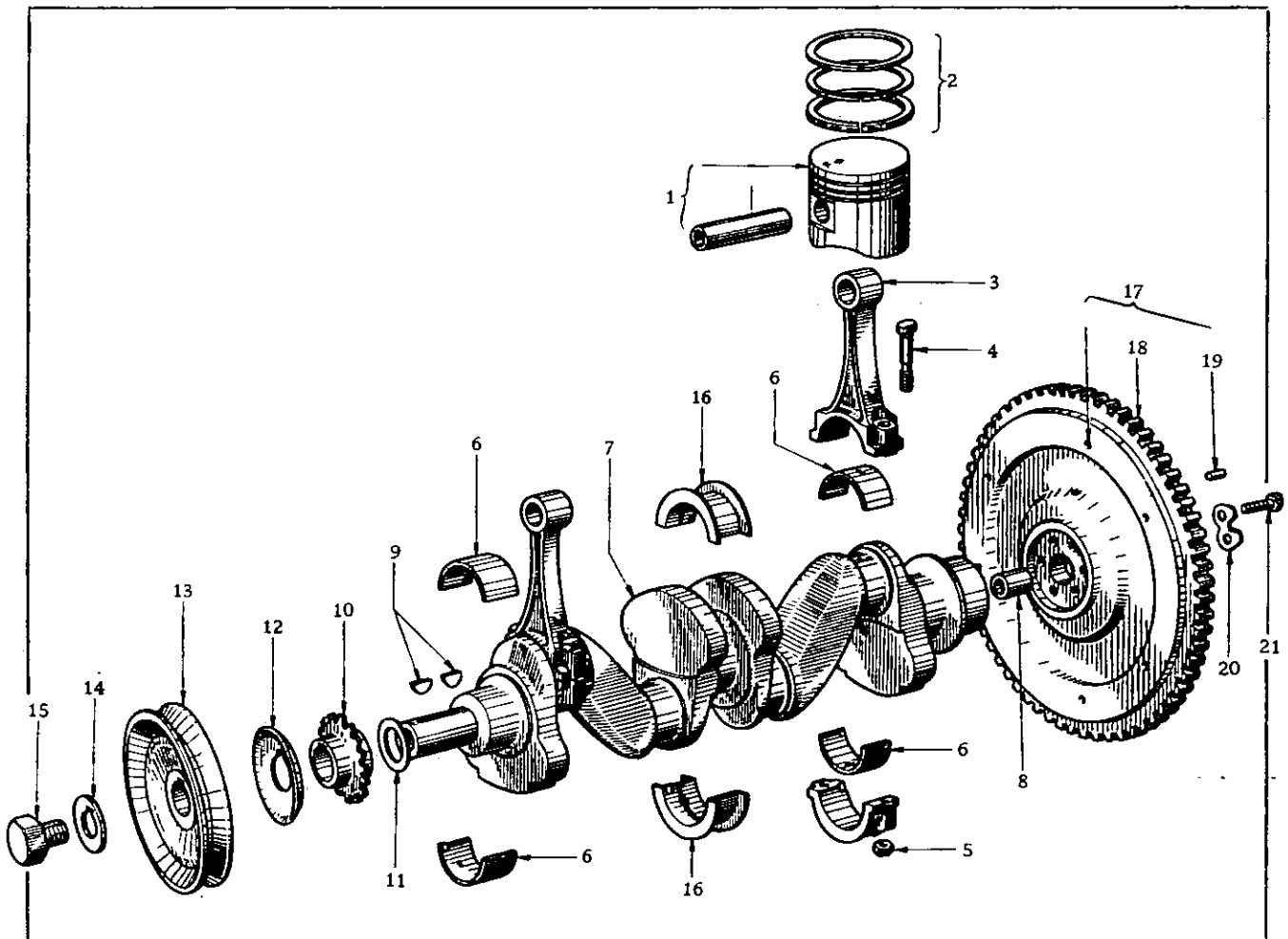
This is a reversal of the introductions for removal.





Camshaft & Valve Mechanism

1	Camshaft	13	Spring-chain tensioner	25	Plug-expansion, rocker shaft
2	Dowel-camshaft gear	14	Support-chain tensioner spring	26	Spring-inside, rocker shaft
3	Plate-camshaft	15	Bolt	27	Bracket-rocker shaft
4	Bolt	16	Washer-lock	28	Rocker-valve No. 1
5	Washer-lock	17	Valve-intake	29	Rocker-valve No. 2
6	Sprocket-camshaft	18	Valve-exhaust	30	Bolt-rocker shaft
7	Bolt-camshaft sprocket	19	Spring-valve	31	Washer-plain
8	Washer-camshaft	20	Seat-valve spring	32	Spacer-rocker valve
9	Washer-lock	21	Retainer-valve spring	33	Screw
10	Chain-camshaft	22	Collet-valve	34	Nut
11	Tensioner-chain	23	Seal-oil, valve	35	Rod-push
12	Bolt-chain tensioner	24	Ass'y-shaft, valve rocker	36	Lifter-valve



Piston & Crank Shaft

1	Set-piston, with piston pin	8	Bushing-pilot	15	Bolt-crank pulley
2	Set-ring, piston	9	Key-woodruff	16	Set-bushing, main bearing
3	Ass'y-rod, connecting	10	Sprocket-crank shaft	17	Ass'y-flywheel
4	Bolt-connecting rod	11	Washer-packing, crank shaft	18	Gear-ring, flywheel
5	Nut	12	Thrower-oil, crank shaft	19	Dowel-flywheel
6	Bushing-connecting rod	13	Pulley-crank shaft	20	Washer-flywheel
7	Ass'y-crank shaft	14	Washer-lock, pulley bolt	21	Bolt-flywheel

CRANKSHAFT

Wear limit at pin portion of	0.03 mm (elliptic or taper)
crank shaft journal	
Limit crank shaft alignment	Not to exceed 0.05 mm
Side clearance of crank shaft	Within 0.3 mm
Crank shaft journal oil clearance	0.02 ~ 0.06 mm
Portion of crank shaft thrust bushing	2nd side
Bushing over size of crank shaft	S.T.D. 0.25, 0.50, 0.75, 1.00
journal	
Dimension of crank shaft journal	49.951 ~ 49.964 mm
Dimension of crank shaft pin	44.961 ~ 44.974 mm

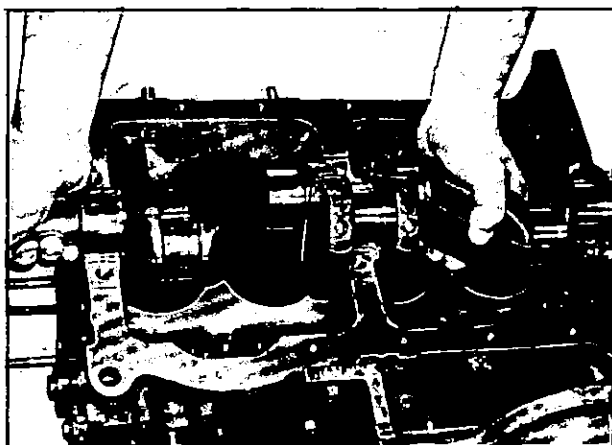
Main Bearing Caps

Remove the flywheel and clutch.

Take off the timing chain, the sump and strainer, and the engine rear mounting plate. Unlock and remove the bolts securing the main bearing caps to the cylinder block, also the two bolts securing the front cap to the engine front bearer plate.

Note that a thrust washer is fitted on each side of the center main bearing to take the crankshaft end thrust. These thrust washers each consist of two semicircular valves, one half having a lug, which is located in a recess in the detachable half of the bearing, the other being plain.

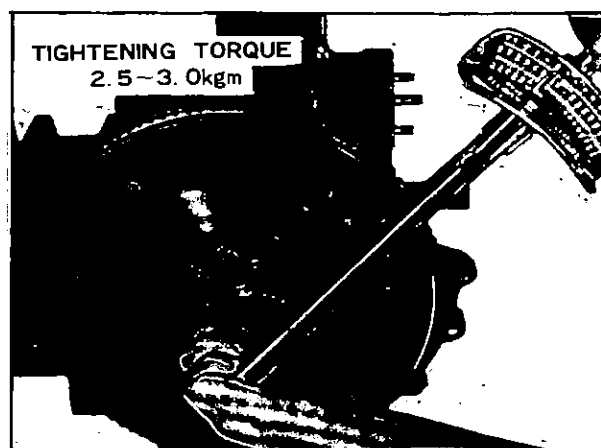
When fitting new bearings no scraping is required as they are machined to give the correct running clearance of 0.005-0.002 in. (0.0127-0.0508 mm).



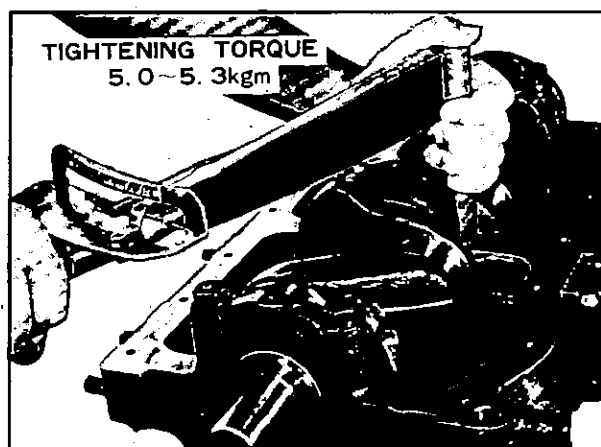
Ensure that the locating tangs are properly engaged in their recesses.

Handle the new bearings carefully so as not to damage the fine surface finish.

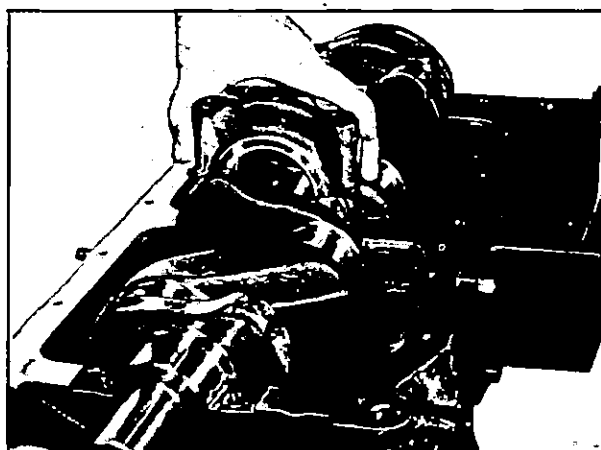
Remove all traces of dirt and oil from the housings and thoroughly dry them with a non-fluffy rag. Make sure that the oilways are clear. When fitting the bearing caps ensure that they are replaced the right-way round. Each cap is punch marked, and the marks should race the camshaft side of the engine.



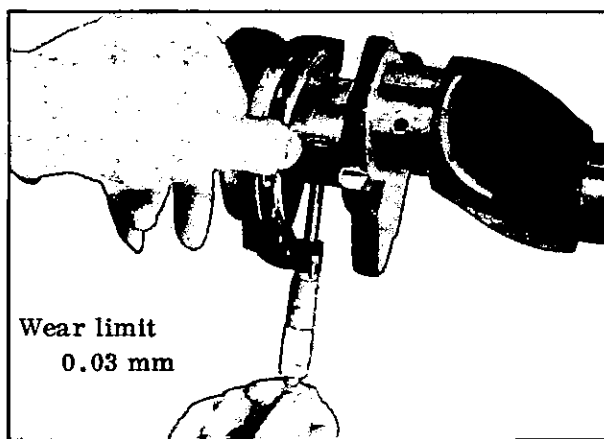
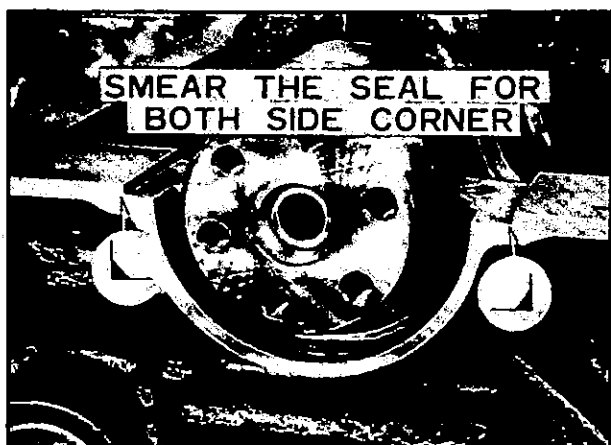
Removing Flywheel



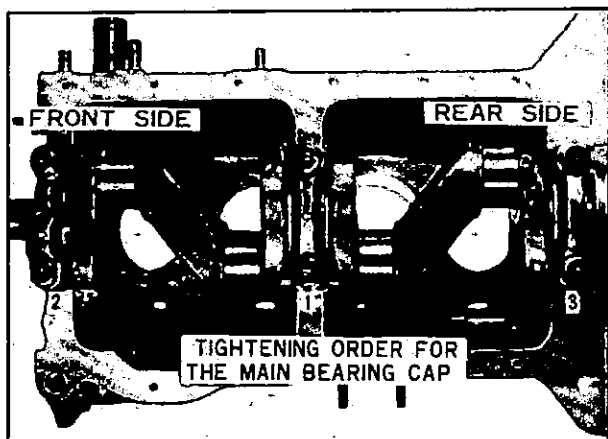
Main Bearing Cap



Removing Crankshaft



Measuring Crankshaft Pin and Journal



Caution

Never file the bearing caps to take up excessive play as this will cause ovality.

Always cover the bearing surfaces with engine oil when they are replaced.

The main bearing caps are held in position by setscrews and lock washers. Pull the setscrews up tight with a torque wrench set to a loading of 5.0 ~ 5.3 kg-m.

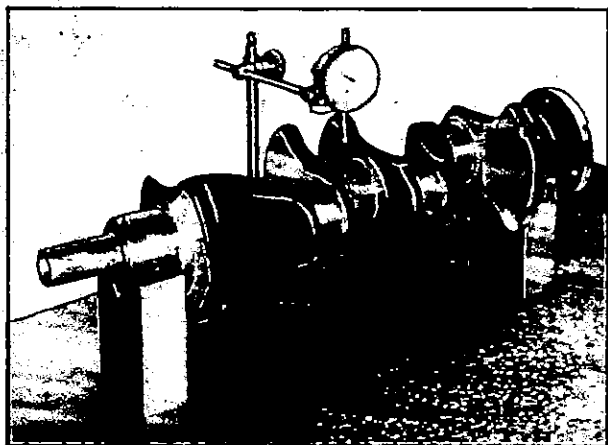
When refitting the main bearing caps tighten the center one first, after each cap is tightened rotate the crankshaft to ascertain that it revolves freely.

If it is tight remove the last cap tightened, and examine the bearing and its seating for foreign matter.

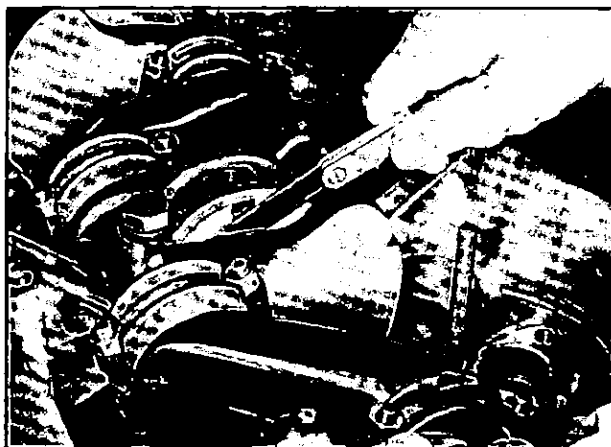
Check the crankshaft bent by means of a dial gauge. This should be within 0.05 mm.

If a bearing has "run", it is essential to clean out all oilways in the crankshaft and block. Wash out the engine sump and the strainer.

The oil pump should be dismantled and cleaned. Ensure that no particles of bearing, metal are left within the engine lubrication system.



*Accuracy to less than 0.015 mm
correcting measuring bend of crank
shaft allowable limit 0.05 mm*



*Measuring Side Clearance Play
of Crankshaft (within 0.3 mm)*

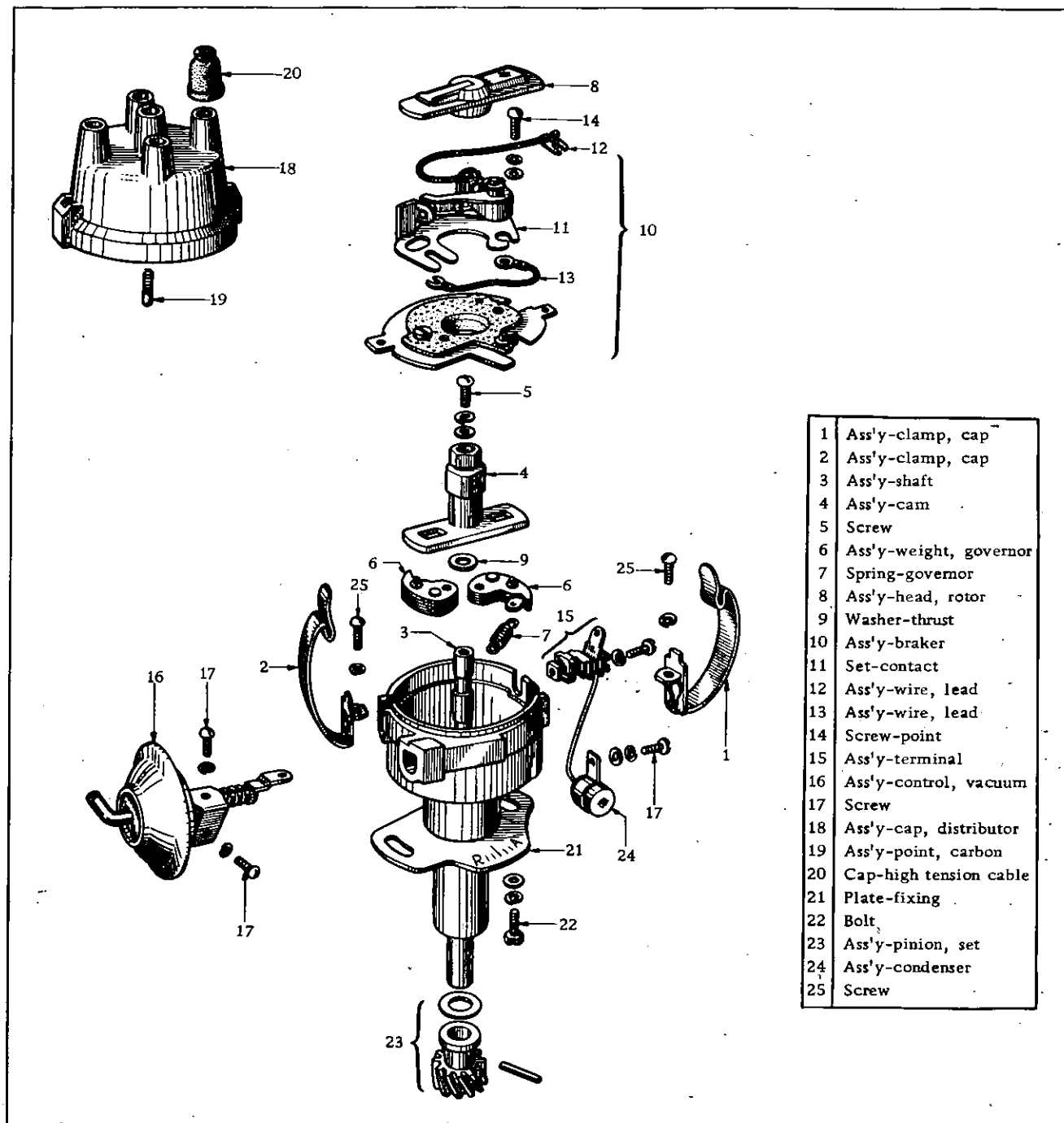


DATSUN 1000



IGNITION TIMING

DISTRIBUTOR



Distributor (Hitachi)

DATSUN 1000

Inside the distributor is a breaker point as shown in Figure. This breaker makes and breaks contact several thousand times in one minute.

Each time this breaker makes contact, a spark is generated in one of the spark plugs. Therefore, the maintenance of this breaker must not be treated lightly. Also, because the time during which the ignition coil current flows varies with the gap between these breaker points, see that this gap is maintained at the standard value, which is 0.45 mm.

The breaker points must be kept free of grease and oil. If the points should become burnt or blackened, they are cleaned with a fine honing stone or crocus cloth after which they should be wiped clean with a piece of cloth which has been dampened with gasoline.

If the points are badly burnt, they must be replaced. Breaker points must always be replaced as sets.

Adjusting the Breaker Points

To adjust the breaker points, turn the engine crankshaft with the crank handle until the breaker is fully open. Then loosen the breaker point fixing screw. Next, by turning the adjusting screw, move the plate until a feeler gauge of 0.45 to 0.55 mm (0.018 to 0.022 ins.) thickness slides easily between the breaker points. Then tighten the fixing screw securely.

Finally, check the gap once more; then reinstall the rotor. The interior and exterior of the cap is wiped clean with a soft, dry piece of cloth, extra attention being paid to the areas between the terminals. Clean the center

electrode on the inside of the cap also.

Whether or not the vacuum type timing advancer is functioning properly, can be determined by the inspection pointer located at the diaphragm if, as the engine is being run, this pointer moves when the engine speed is suddenly changed, the advancer is satisfactory.

ADJUSTING THE IGNITION TIMING

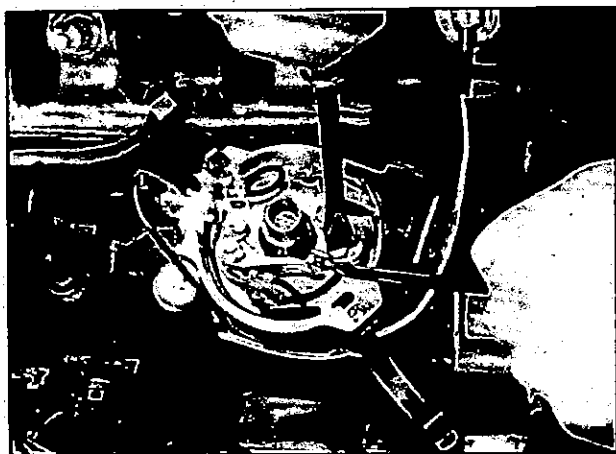
The ignition timing is adjusted to 10 degrees before top dead center with the engine stopped as shown in Figure. With this adjustment, the automatic timing advancer of the distributor advances the ignition timing even further at the time the engine starts to rotate, and the timing is maintained constantly at valves suitable for the rotational speed.

With the engine stopped, adjust so that the distributor breaker point just breaks when the piston of the No. 1 cylinder is in its 8 degrees before top dead center position for compression. If a timing lamp is used, the standard ignition timing is 15 degrees before top dead center at idling (600 rpm.) speed.

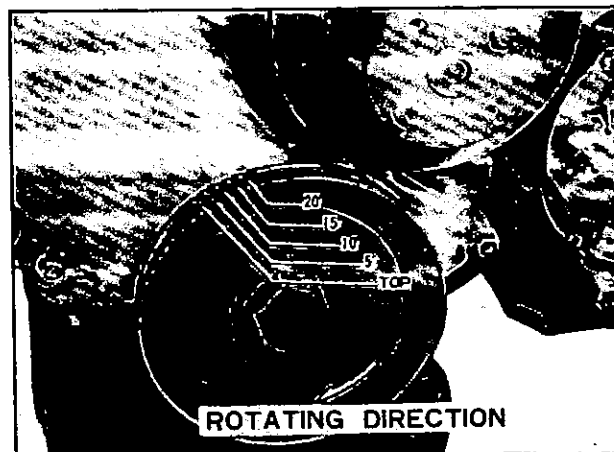
In the case of marks which are not evenly spaced, pointers indicate 10 deg., 15 deg. and 20 deg., positions before top dead center.

Adjustment is made by the following procedure.

1. First adjust the distributor to the correct gap as described previously.



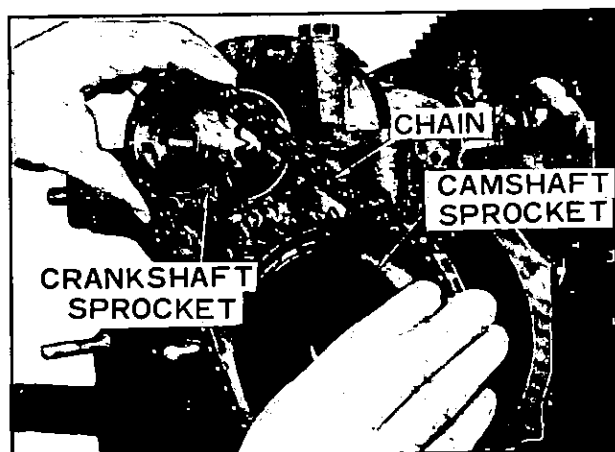
Adjusting the Point Gap



Checking the Ignition Timing

2. Turn the crankshaft gradually until the top dead center mark on the pulley periphery coincides with the mark for 10 degrees before top dead center on the timing gear cover as the crankshaft approaches its positions somewhat before that corresponding to the end of the compression stroke of the No. 1 piston. Stop the crankshaft in this position. The compression stroke of the No. 1 piston can be determined if the spark plug of the No. 1 cylinder is removed, the hole plugged with a finger, and the crankshaft turned. With the crankshaft in the previously-mentioned position, the No. 1 piston is in its position of 10 degrees before top dead center of compression.

3. Next, inserting the driving shaft of the distributor at an angle to the engine, engage the gear on its lower end with the gear on the camshaft. During this assembly place the slot of the distributor drive of the upper end of the shaft somewhat to the left as shown in Figure. At this time, the smaller of the semicircle is placed toward the front.



Setting of Timing Gear

4. Adjusting the direction of the rotor so that it engages the drive shaft slot, mount the distributor to the engine. During this assembly the directions of the distributor and rotor must be as shown in Figure. At the same time, the breaker must be in its position when it is just beginning to open.

If these conditions do not coincide, they are made to do so by slightly turning the distributor body only.

To determine the position when the breaker point is just beginning to open, turn on the ignition key; hold the end of the No. 1 spark cord about 1/4 inch away from the cylinder head; and turn the body until spark jumps across the gap.

The off-set slot position of the drive shaft when the No. 1 piston is in its compression top dead center position is shown here.

5. Next put the distributor cap on and clamp it securely with the clip.
6. To the No. 1 spark plug connect the cord from the terminal to which the arm of the rotor is pointing. Thereafter connect the terminal cords to their spark plugs in the counter-clockwise order so as to obtain a 1-3-4-2 firing order.
7. Upon completion of the wiring, cover the distributor with a rubber cap. The engine should now start properly.

Ordinarily, the pointer of the octane selector is set at its zero reading during the ignition timing adjustment. If the octane number of the fuel being used is low and the engine knocks, the pointer is adjusted to the right (R) to the optimum advance angle.

Conversely, if the octane number is high the pointer is adjusted to the left (A). One unit of calibration of the selector corresponds to 2 degrees of the distributor angle and to 4 degrees of the crankshaft angle.

When a timing lamp is used, the standard setting is 15 degrees before top dead center with the engine idling (600-620). In any case, the optimum adjustment is that in which a slight knocking is heard when, with the car running at low speed in "HIGH" (TOP) gear, acceleration is applied suddenly.

TROUBLES & REMEDIES

Excessive Oil Consumption

Burning Oil

- (1) Rings not correctly seated to cylinder wall
Give sufficient time for rings to seat
Replace if necessary
- (2) Piston rings worn excessively or stuck in
Replace ring
- (3) Excessive clearance between piston and
cylinder wall due to wear or improper
fitting
Fit new pistons
- (4) Cylinder walls, scored, tapered or out of
round
Recondition cylinders and fit new
pistons
- (5) Piston ring oil return holes clogged with
carbon
Replace rings
- (6) Piston ring broken
Replace rings
- (7) Valve stem oil seals missing or leaking
Replace seals, check for sealing

Leaking Oil

- (1) Rocker arm cover gasket or tightening
tappet cover damaged or loose
Tighten covers or replace gasket
- (2) Oil pan drain plug loose
Tighten drain plug
- (3) Oil pan retainer bolts loose
Tighten oil pan bolts
- (4) Oil pan gasket damaged
Replace gasket
- (5) Timing cover loose or gasket damaged
Tighten cover bolts or replace gasket
- (6) Fuel pump loose or gasket damaged
Tighten fuel pump bolts or replace
gasket
- (7) Rear main bearing leaking oil into clutch
housing or flywheel housing
Adjust or replace main bearing or
main bearing oil seal

Lack of Engine Power

Ignition System Improperly Adjusted

- (1) Spark plug faulty
Replace or clean, adjust and seat spark
plugs
- (2) Distributor points not set correctly
Set distributor points and timing engine
- (3) Ignition not properly timed
Set ignition by the instruction under
correct specification of engine

Lack of Fuel

- (1) Gas line partly plugged
Clean gas lines
- (2) Dirt or water in carburetor
Clean carburetor and fuel pump
- (3) Dirt in gasoline tank
Clean the tank
- (4) Air leaks in gasoline line
Check gasoline lines and tighten
- (5) Fuel pump not functioning properly
Replace or repair fuel pump

Carburetor Air Inlet Restricted

- (1) Air cleaner dirty
Clean air cleaner
- (2) Carburetor choke partly closed
Adjust or replace choke mechanism

Over Heat

- (1) Lack of water
Refill system
- (2) Fan belt loose
Adjust or replace
- (3) Fan belt worn or oil soaked
Replace belt
- (4) Water pump inoperative
Replace water pump
- (5) Thermostat sticking closed
Replace thermostat

ENGINE

- (6) Cooling system clogged
Clean and reverse flush
- (7) Incorrect ignition or valve timing
Retime engine
- (8) Improper grade and viscosity oil being used
Change to correct oil
- (9) Fuel mixture too lean
Overhaul or adjust carburetor
- (10) Valve improperly adjusted
Adjust valves
- (11) Exhaust system partly restricted
Clean or replace

Over Cooling

- Thermostat holding open
Replace thermostat

Hard Starting

Slow cranking

- (1) Heavy engine oil
Change to lighter oil
- (2) Partially discharged battery
Change battery
- (3) Faulty or undercapacity battery
Replace battery
- (4) Poor battery connections
Clean and tighten or replace connections
- (5) Faulty starter switch
Replace switch
- (6) Faulty starting motor or starting switch

Ignition Troubles

- (1) Distributor points burned or corroded
Clean or replace points
- (2) Points improperly adjusted
Readjust points correctly
- (3) Spark plugs improperly gapped
Set plug gap correctly
0.7 ~ 0.8 mm (0.0275 ~ 0.0315 in.)

- (4) Spark plug codes loose and corroded in distributor cap
Clean code and cap terminals
- (5) Loose connections in primary circuit
Tighten all connections in primary circuit
- (6) Series resistance in condenser circuit
Clean all connections in condenser circuit
- (7) Low capacity condenser
Install proper condenser

Engine Condition

- (1) Valves burned
Grind valves or change
- (2) Valves holding open
Adjust valves
- (3) Leaking manifold gasket
Tighten manifold bolts or replace gasket
- (4) Loose carburetor mounting
Tighten carburetor mounting bolts
- (5) Faulty pistons, rings or cylinders
See "Lack of power"

Carburetion

- (1) Choke not working properly
Adjust or repair choke mechanism
- (2) Throttle not set properly
Set throttle
- (3) Carburetor dirty and passages restricted
Overhaul carburetor

Spitting and Detonation

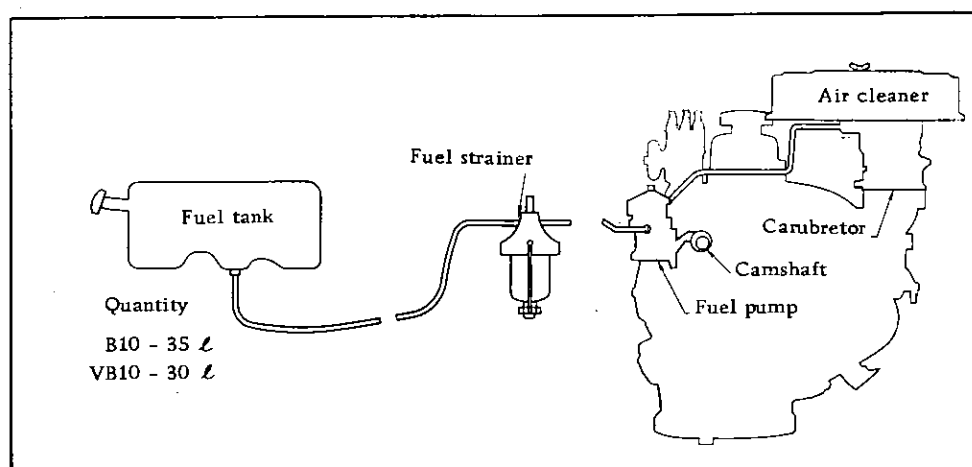
Ignition trouble

- (1) Loose wiring connections
Tighten all code connections
- (2) Faulty wiring
Replace faulty wiring
- (3) Faulty spark plugs
Clean or replace and adjust plug gap

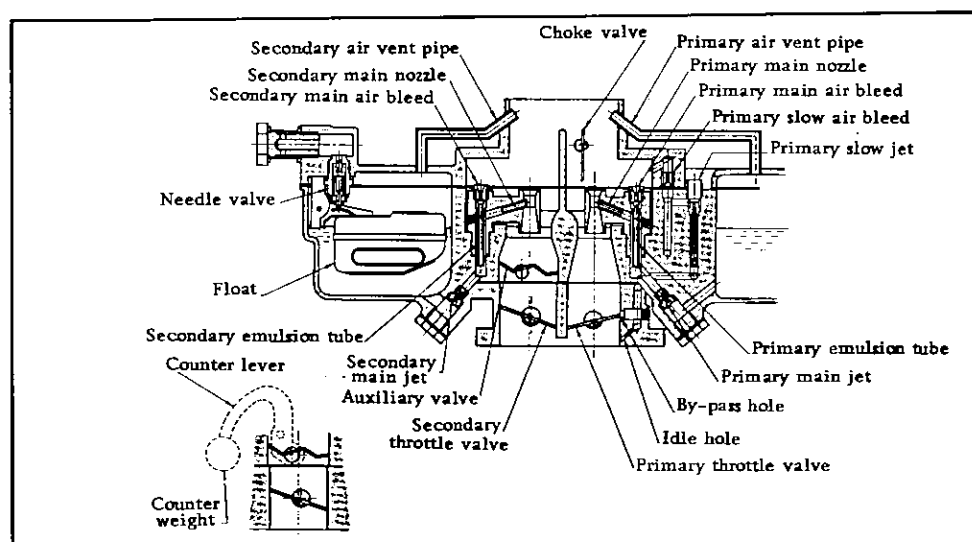
DATSUN 1000



FUEL SYSTEM



CARBURETOR



Constructure

Model	Hitachi DCG 286-3	
Type	Down draft, 2 barrel	
	Primary	Secondary
Throttle valve bore	26 mm	28 mm
Venturi size	20 x 7 mm	24 x 7 mm
Main jet	# 95	#140 (160)
Main air bleed	# 80	#120
Slow jet	# 40	
Slow air bleed	#210 (220)	
Power jet	# 60	
Needle valve dia.	1.5 mm	
Float level	18 ± 1 mm	Fuel pressure
		0.16 kg/cm ²

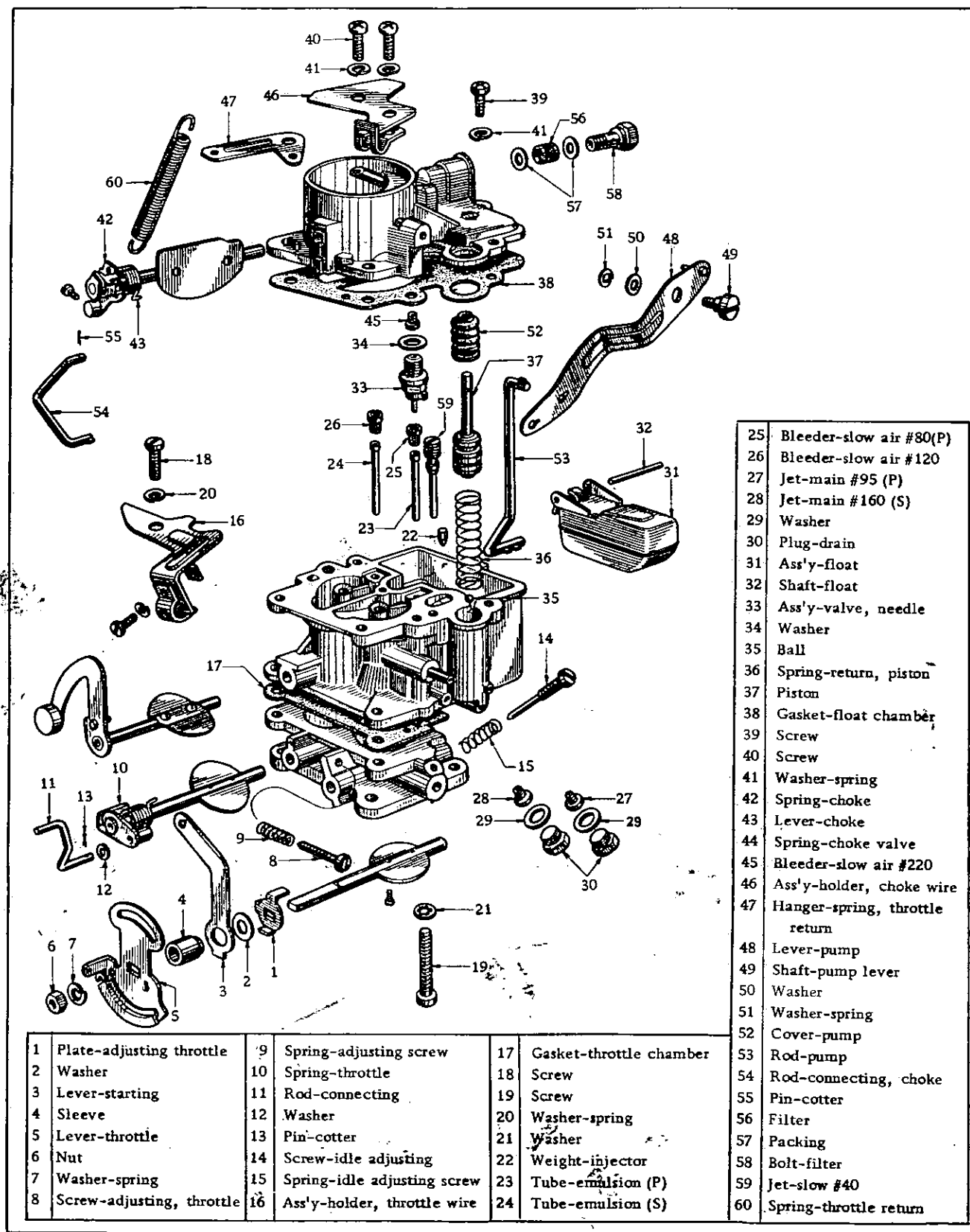
The secondary throttle valve is open to begin when the primary throttle valve is open at 48 degrees.

The carburetor has the function of automizing the fuel, mixing it in suitable ratio to air and supplying the mixture to the engine.

It is therefore an important part which can influence the performance of the engine.

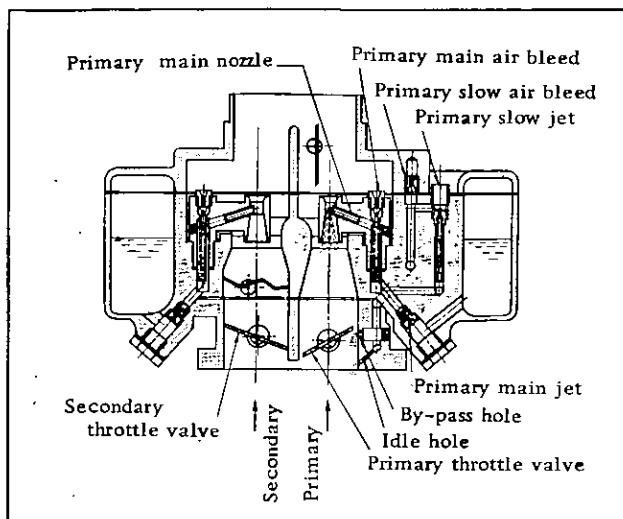
The carburetor is a highly efficient one of two barrel two step and down draft type having the following special features.

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Carburetor (Hitachi)

Main Carburetting System (Primary)



Partially Loading

The fuel flowing out of the passage at the bottom of the float chamber passes through the primary main jet and then mixed with the air coming from the main air bleed to be minute drops and inject into the venturi through the main nozzle.

When the throttle valve is widely open and the engine requires dense mixture gas, the accelerating pump opens its power valve, from where the fuel also flows into the main system.

The power valve begins to operate when the throttle valve opens 48 degrees from full closed position.

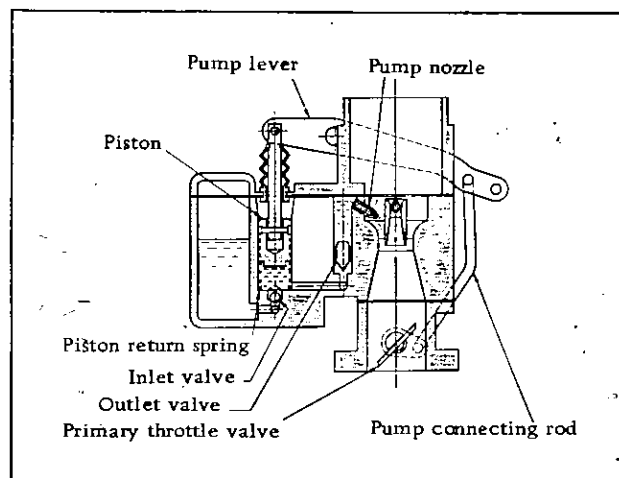
Slow Speed System

Passing through the main jet, the fuel passage separate from main line and flows through the slow jet, slow air bleed first, slow economizer, slow air bleed second and inject from the by-pass holes and idle holes.

Accelerating System

Mechanical accelerating pump synchronized with the throttle valve is adapted. When throttle valve is closed, the piston rod is pushed up with the linkage, which pushed up the piston through the dumper spring. When the piston is coming down, the inlet check valve closes the outlet check valve opens and the fuel within the pump is blown out from the pump jet by the compressed dumper spring and hits against the side wall

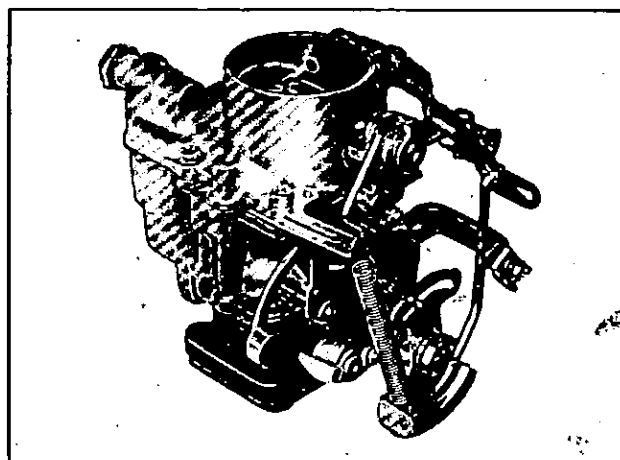
of the small venturi to be minute drops, compensating transient sparseness of the fuel. A jetting amount of the fuel can be varied with the two holes provided on the pump arm, that is, the inserting positions of the connecting rod.



At Accelerating

Starting System

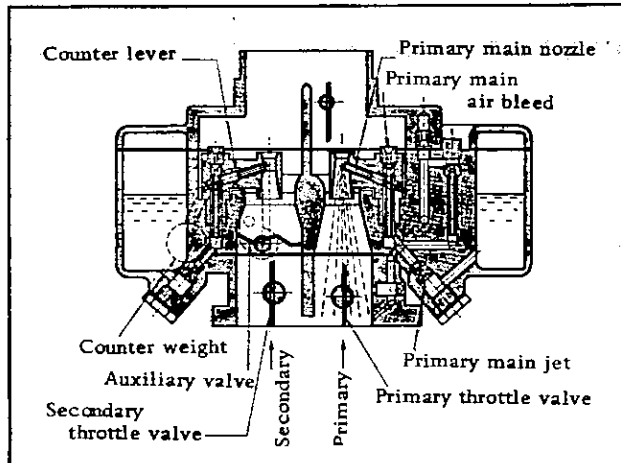
The choke valve is provided with the spring and installed eccentrically on the normal carburetting device and synchronized with the throttle valve. When the choke is fully closed, the throttle valve opens about 14 degrees from a full close. This is the best condition to start operation. The synchronization of the choke valve and the throttle valve can be exactly maintained often the engine has started firing.



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Main Carburetting System (Secondary)

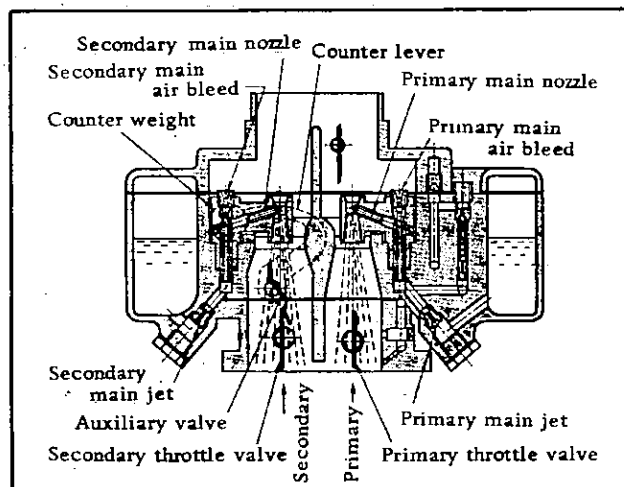
Same as the normal carburetting function the fuel flowing out of the passage at the bottom of the float chamber passes through the secondary main jet and become minute drops mixing with the air coming from the main air bleed and is blown into the venturi through the main nozzle.



At Full Open, Slow Speed

When the throttle valve of the normal carburetor is widely opened and the engine produces high power, the throttle valve of the power carburetor begins to open by the synchronized linkage.

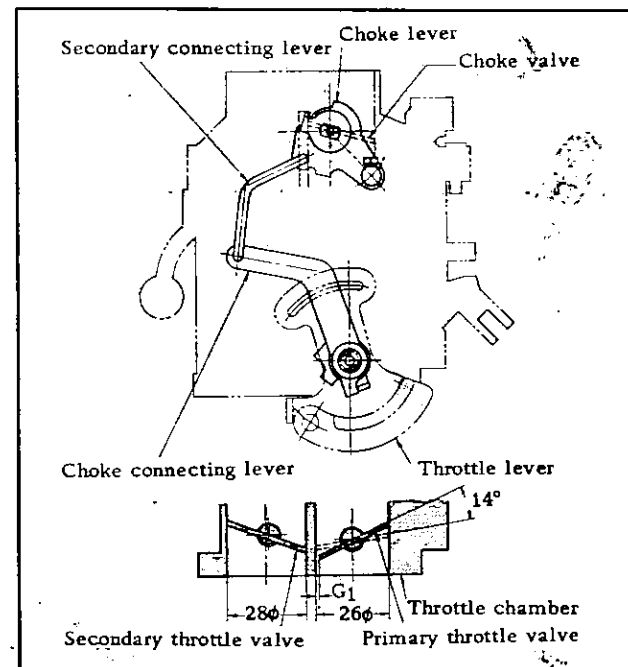
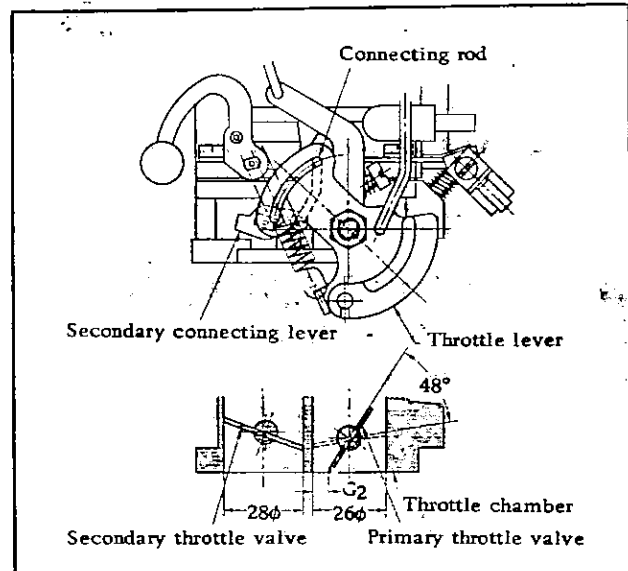
However, at the top of the power carburetor throttle valve is an auxiliary valve which is not open at a slow speed with a heavy load due to the load of the counter weight connected to the valve shaft even when the throttle valve is open.



At Full Open, High Speed

When the engine change to still higher revolutions, the auxiliary valve open against the load of the counter weight and the power carburetor starts operation for high power. When the normal carburetor throttle valve is in a full open, the power carburetor throttle valve is also to be in a full open.

Adjustment for Connection of Primary and Secondary Valves



Opening Degree to Begin Starting

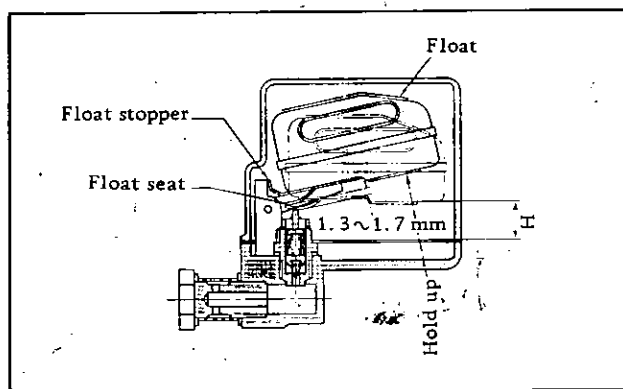
Float Chamber

Adjustment of the float level can be done from outside by adding or subtracting the needle valve carrier gasket after removing the float needle valve installed at the inlet connector.

As ventilation within the float chamber is of a air vent method and pressure within the venturi and the float chamber is always constant no matter how suctional resistance of the air cleaner varies, fuel consumption can be always economically maintained.

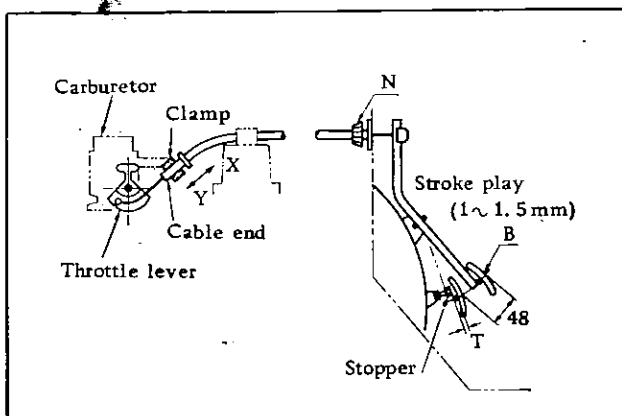
Adjusting Fuel Level

At the stage, the float upper surface must be level and parallel with the chamber top. (Dimension 10.5 mm height) Adjust by bending the float seat.



Adjusting the Float Level is Done

Adjusting of Accelerator Pedal



The accelerator must be so adjusted by the adjusting plate at the carburetor side that the throttle valve may be full open with full pedal on and of slight gap with pedal off. After adjusting this, tighten up surely the nuts of the adjusting plate.

THE GASOLINE TANK

The fuel tank has a capacity of 41.0 liters and is situated at the rear of the luggage compartment.

The fuel pump, operated off the camshaft draws fuel from the tank and forces it into the carburetor float chamber. A large and efficient air cleaner fillers the air supply to the carburetor.

Draining the Fuel

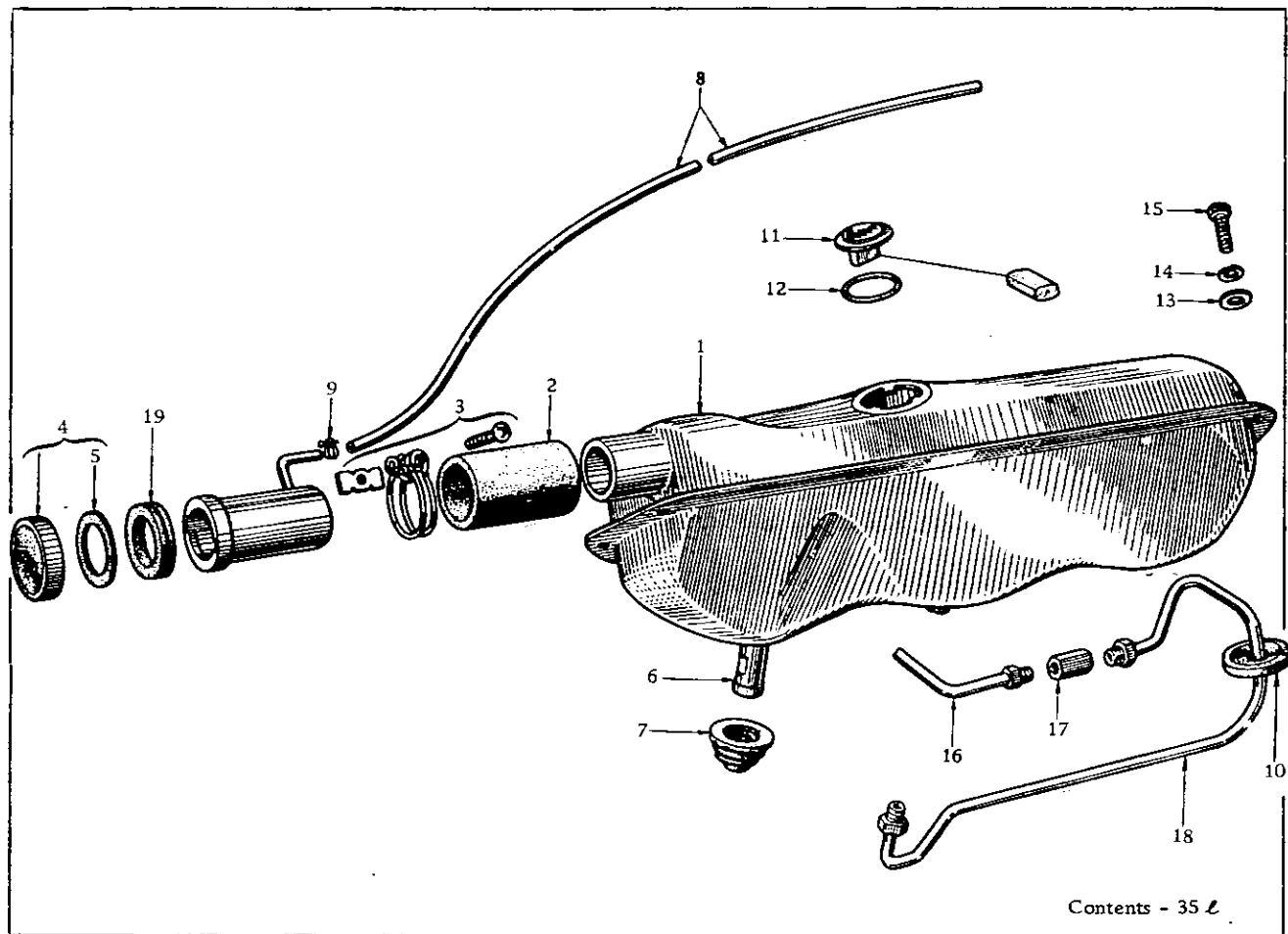
The fuel tank is drained by turning the wrench operated drain cock.

Fuel Tank Gauge Unit

Situated on the top face of the tank is the gauge unit. To remove, withdraw the set screws which secure the unit to the tank not forgetting to disconnect the electrical lead beforehand. Care must be taken not to strain or bend the float lever as this may seriously effect subsequent gauge readings. Remember this also applies when refitting the unit.

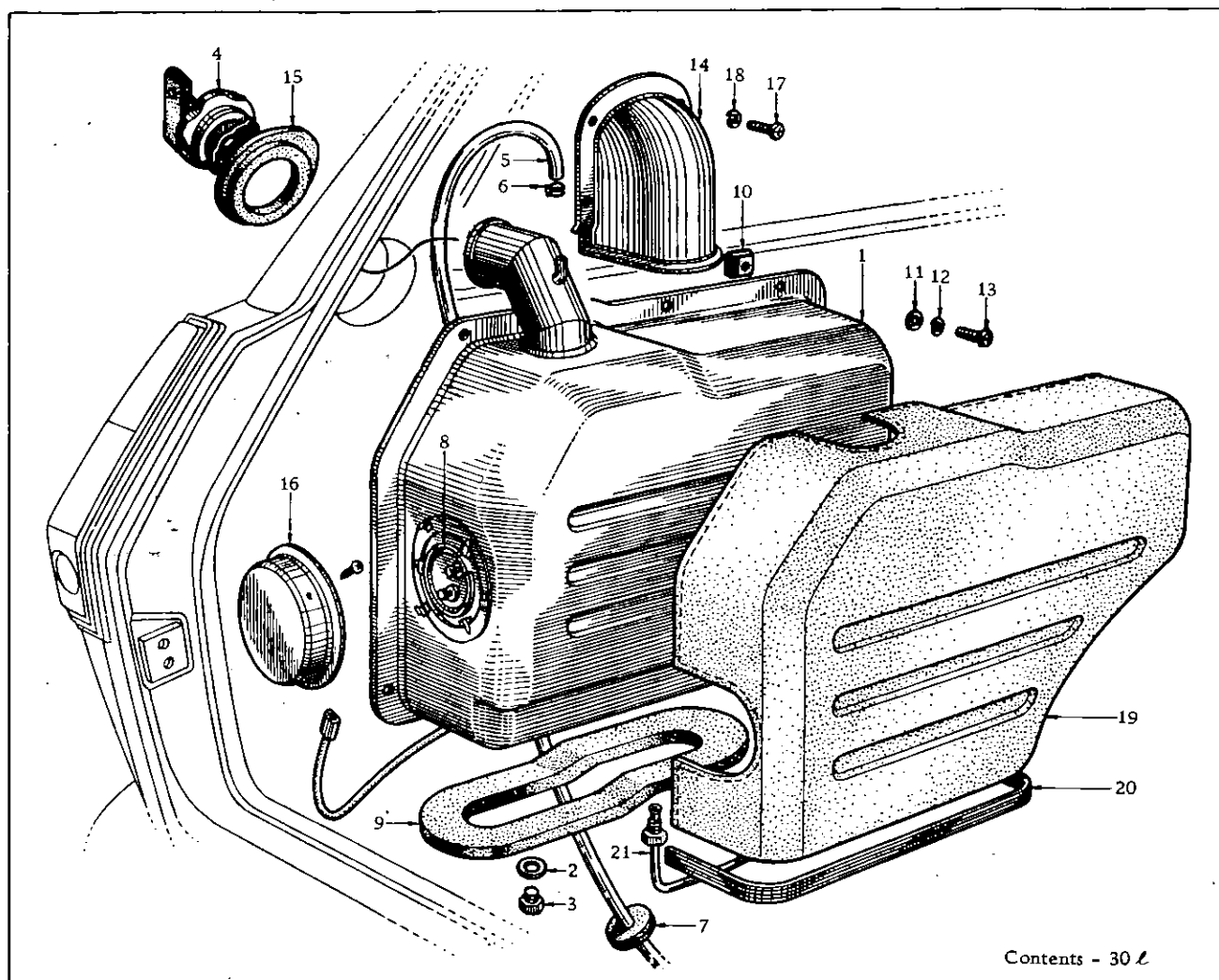
Examine the joint washer to ensure that it is in position and undamaged. This is essential as the joint between the tank and gauge unit must be fuel tight.

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Fuel Tank (Sedan)

1	Ass'y-tank, fuel	11	Unit-gauge, fuel tank
2	Hose-filler tube	12	Ring-"O", fuel gauge unit
3	Clamp-hose	13	Washer-plain
4	Ass'y-cap, filler	14	Washer-lock
5	Packing-filler cap	15	Screw
6	Ass'y-tube, drain	16	Ass'y-tube, fuel tank to fuel strainer
7	Grommet-rubber	17	Connector-fuel tube
8	Tube-breather	18	Ass'y-tube, fuel tank to connector
9	Clamp-hose	19	Grommet-fuel tank tube
10	Grommet		



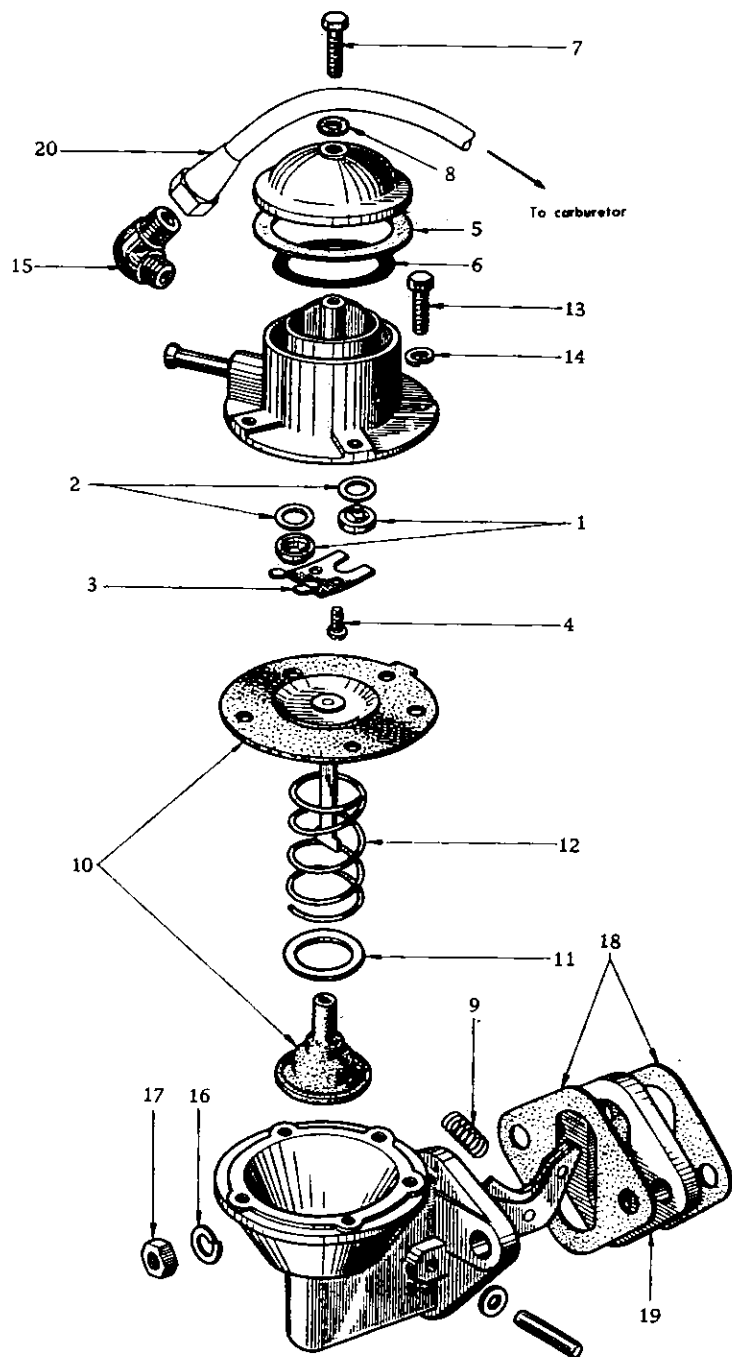
Contents - 30 l

Fuel Tank (Van)

1	Ass'y-tank, fuel	12	Washer-lock
2	Washer-drain plug	13	Screw
3	Plug-drain	14	Cover-fuel filler neck
4	Ass'y-cap, filler, fuel tank	15	Grommet
5	Tube-breather	16	Cover-fuel gauge
6	Clamp-hose	17	Screw
7	Grommet	18	Washer-plain
8	Unit-gauge, fuel tank	19	Cover-fuel tank
9	Packing-fuel tank	20	Welt-rear floor
10	Seat-fuel tank mounting	21	Ass'y-tube, fuel tank to strainer
11	Washer-plain		

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FUEL PUMP



1	Ass'y-valve, fuel pump
2	Packing-valve
3	Retainer
4	Screw-retainer
5	Packing-cap
6	Screen
7	Bolt-cap
8	Packing-cap bolt
9	Spring-rocker arm
10	Ass'y-diaphragm, with seal
11	Washer-seal
12	Spring-diaphragm
13	Screw-body set
14	Washer
15	Elbow
16	Washer-lock
17	Nut
18	Washer-joint
19	Spacer-fuel pump
20	Ass'y-tube, fuel pump to carburetor

Fuel Pump

Cam r.p.m.	Outlet Pressure mm-Hg	Outlet Quantity cc/min.
300	130	450
1,000	130	450
3,000	130	750

Disassembly

- 1) Disconnect the tube.
- 2) Take off the attached bolts of body.
- 3) Mark on the edge of body for preparation of assembly again.
- 4) Detach the cap, packing and screen.
- 5) Separate the upper and lower body.
- 6) Take out the two valves from the upper body.
- 7) Hook out the diaphragm with the seal from the rocker arm. (Turn it about 90 degrees horizontal way.)
- 8) Pull out the pin to separate the rocker arm the assembling of components is the reversal procedure in this order.

The fuel pump, which is of the diaphragm type, is mechanically driven by the eccentric part of the camshaft of the engine.

It draws gasoline from the tank and delivers it under pressure to the carburetor.

By the rotation of camshaft, rocker arm is pushed and pull rod of diaphragm is pulled down.

At the same time, diaphragm goes down against diaphragm spring and then is pushed up again by its spring.

By the movements of the diaphragm and functioning of the valves at the inlet and outlet of the pump chamber, gasoline is drawn up from the tank to the carburetor.

If the float chamber of the carburetor contains enough gasoline and the needle valve is closed, gasoline is not allowed into the carburetor.

Thus gasoline is stored in the pump chamber and due to its pressure, the diaphragm is kept down and cannot return.

Under this condition, the rocker arm works in vain, as the rod remains low.

The rocker arm spring serves to prevent noise, keeping the rocker arm pushed against the eccentric of the camshaft.

Disassembling & Inspection

Checking with Fuel Pump Installed on Engine:

Switch off and stop the engine. Disconnect the fuel pipe at the inlet union of the carburetor, and then turn the engine with the crank handle.

Now the gasoline should be ejected vigorously from the tip of the pipe once every two rotations of the crankshaft.

Removal from Engine:

Fuel pump can be easily removed by disconnecting the inlet and outlet unions and loosening the 2 attachment nuts.

Inspection Prior to Disassembling:

Prior to disassembling of the removed pump, measure the distance between the rocker arm and flange of the lower body by means of a scale and see if the rocker arm, rocker link and pins are worn.

Method of Disassembling:

First wipe dirt off the outer surface of the pump and put marks on both the upper and lower bodies, to make their reassembling easy.

It is easily separated into two when the five screws around the upper body are loosened.

Take great care not to damage the diaphragm during this disassembly.

Checking & Repaires of Parts

- Wash the disassembled parts well in gasoline then inspect them.
- Replace the diaphragm if any damage, impregnation by gasoline.
- Replace a valve assembly if any wear or faulty operation is detected.
- The rocker arm should be replace when its contact face with the cam and that with the link and its pin hole are seriously worn.

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- Renew the arm pin when it is found worn excessively.
- The diaphragm spring, arm spring seldom become faulty, but when weakened, replace them always with standard ones.
- If the diaphragm spring is too strong, it results in overflow of the float chamber of the carburetor.
- The tension of the spring must not be strengthened or weakened arbitrarily by hand.
- Check to see if there is any warp on the joint surfaces of the cap and body, and, after disassembling is over, renew the gasket to keep its air-tightness.

Reassembling & Installing

- Employ standard springs for the various uses as stated before.
- Install valves precisely for close contact with their respective seats.
- In screwing in of upper and lower bodies and diaphragm, fit them together according to the marks which were put before the disassembling and align one screwing hole to its mate, and then screw in at the position where the diaphragm is fully pulled down with the rocker arm pushed towards the side of the body by hand pressure.
- Do not screw in tight one by one since it causes warping. Instead, clamp all the screws round loosely and uniformly. Then tighten them diagonally and lastly retighten all of them in order to make sure.
- As a general rule, gaskets should be replaced by new one.

Installation on the engine is done in the reverse order to that for disassembly.

Be sure to set the rocker arm so that it is contacting the eccentric of camshaft properly, not the rear side or to one side. Replace the gasket between the cylinder block and pump with a new, standard one.

Checking Function

When repairs of the pump is over, or before

it is installed on the engine, make a check to inspect.

When a vacuum gauge is connected to the pump inlet port and the pump is mounted on a tester, the rocker arm is activated by the eccentric of the camshaft revolving at 1,000 rpm. Then the gauge pressure should rise to higher than 400 mm of mercury column, and, even if operation is discontinued, this condition should remain for more than 3 seconds.

When a gauge or tester is not available, test in the following way:

Close the inlet port and outlet port with finger tips. Then, after operating the rocker arm several times, suddenly release the fingers.

The pump is in good conditions if 3 to 5 seconds thence, there can be heard strong inlet and outlet noise respectively.

The pump is mechanically fit for use when, by connecting a hose to the inlet port, it is able to draw up gasoline from a height of more than 0.5 m. After installing the pump, test its functions during operation.

- (A) Connect the gasoline pipe on the inlet port side only. Leave that on the outlet port side as it is, and turn the engine 6 to 7 rotations by means of the crank handle and make sure that there is sure outflow of gasoline from the outlet port.
- (B) Connect the gasoline pipe to the outlet port side and tighten all the piping joints. Then turn the engine again several times to see if there is any leakage of air or gasoline from each connection.

ADJUSTMENT AND INSPECTION OF ENGINE

The engine must always be operated in the best possible condition, and for this purpose, periodic inspection and adjustment must be maintained in a certain order while in use as well as after overhaul.

Order of Inspection and Adjustment of Engine

- (1) Check the cooling water: water level and extent of fillthiness.

- (2) Inspect the battery: all connections, level of electrolyte, specific gravity of electrolyte and voltage.
- (3) Inspect the oil: amount, filthiness, classification and viscosity.
- (4) Cleaning of spark plugs and adjustment of their gaps.
- (5) Measurement of compression pressure of cylinder. The standard compression pressure of the engine is approximately $12.0/350 \text{ kg/cm}^2$ (r.p.m.). Measurement of pressure is made in the following manner:

First, warm up the engine (temperature of cooling water, $70^{\circ}-80^{\circ}\text{C}$) then remove all spark plugs and pull out the throttle knob all the way (that is in the carburetor, the throttle valve and choke valve are fully opened); press a compression gauge against each spark plug hole, and, running the starter motor with a fully charged battery, read the maximum pressure obtained within 5-8 rotations of the motor. This measurement must be made as quickly as possible.



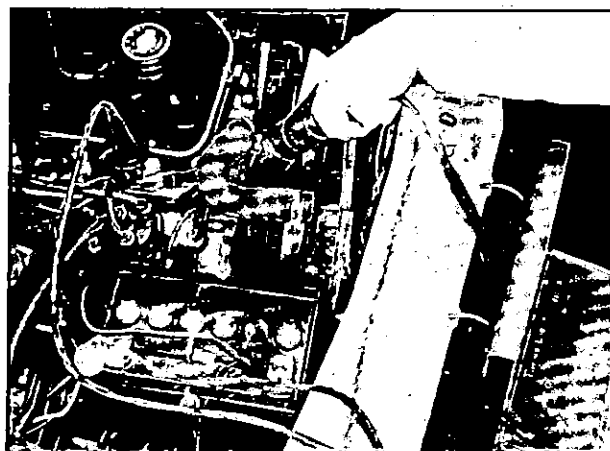
Compression Gauge

If the compression pressure of any one cylinder differs by 10 lb./sq.in. or more from that of another, the cause must be investigated.

- (6) Check and adjust the distributor:
If the breaker contact points have defective contact surfaces, dress them and adjust the gap to 0.45-0.55 mm.

Also turn the cam of the distributor clockwise and check to see if the governor can carry out advancing function.

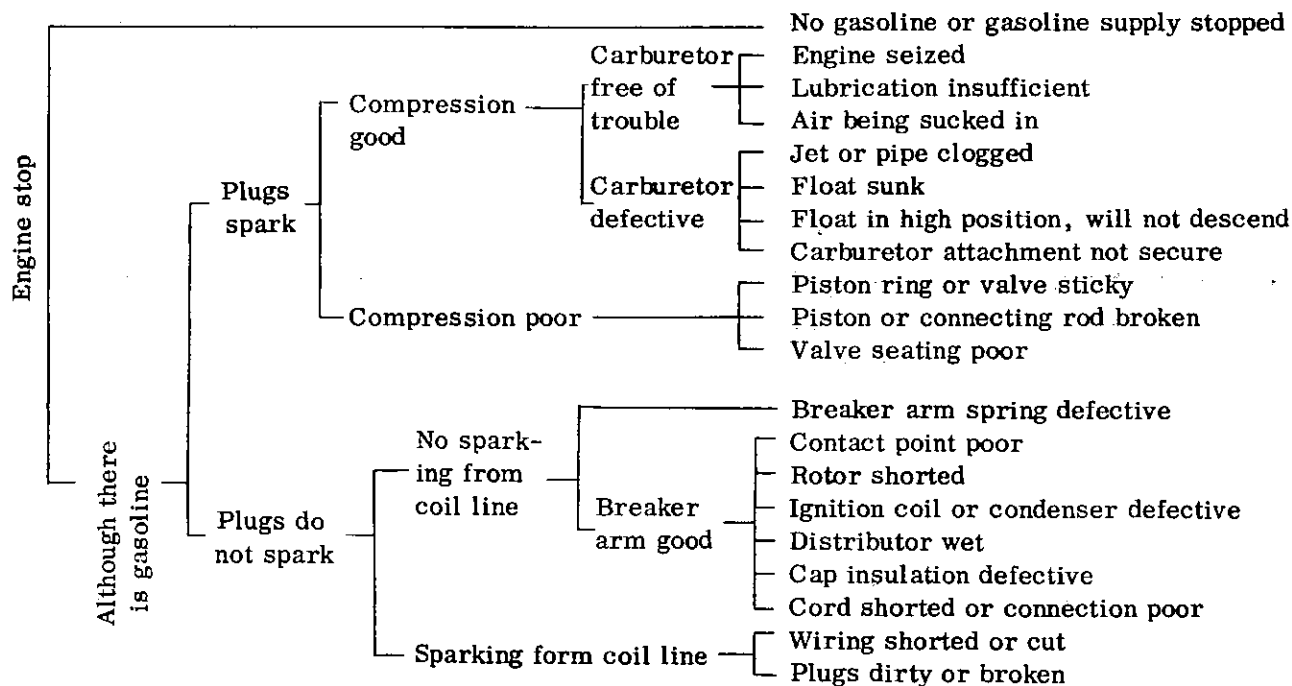
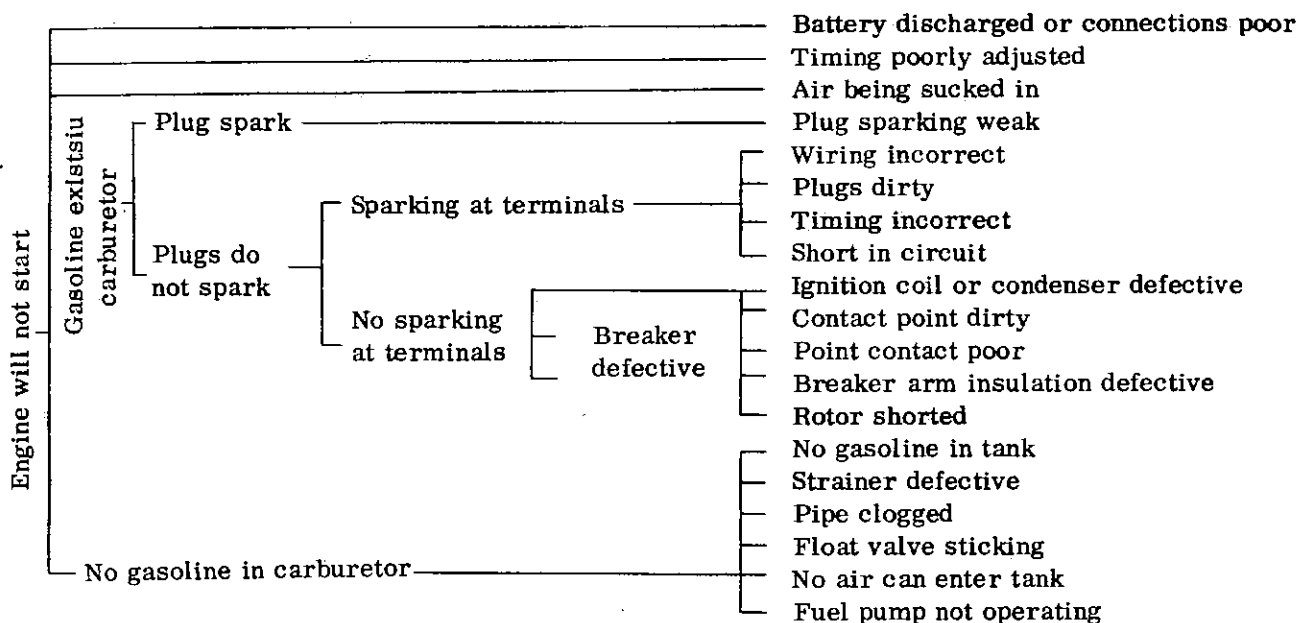
- (7) Adjust ignition timing correctly.
By utilizing a power timing light, the function of the governor can be checked together with the ignition timing (Illumination of crank pulley will enable to inspect the conditions of running and advancing of the timing.) (B.T.D.C. 8°).

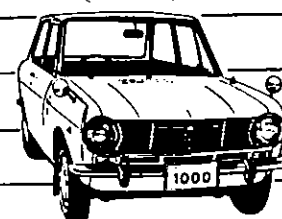
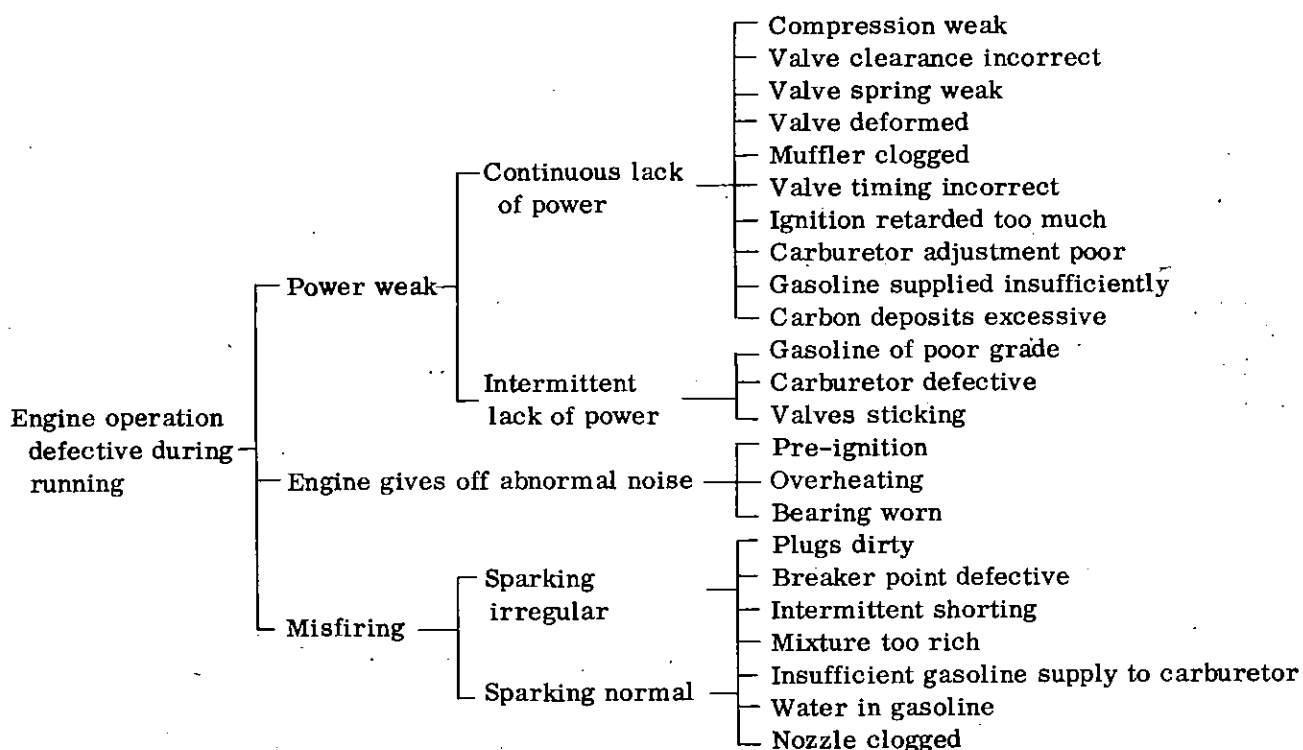


- (8) Inspection of fuel pump and gasoline strainer.
- (9) Adjust the slow setting of carburetor.
- (10) Checking operation of generator.
Check the generating condition and functioning of the cut-out relay by means of indications of the ammeter.
- (11) Adjustment of slack in fan belt.
- (12) Adjustment of valve tappet clearance.
- (13) Road test.
While driving in 3rd. speed at about 25 km/hr., suddenly step on the accelerator. If only a slight knocking results, the ignition timing is correct. Slow speed adjustment is made so that the speed is about 15 km/hr., when driving in 3rd. speed.

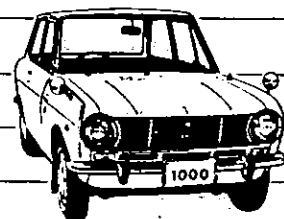
DATSUN 1000

Trouble Shooting Chart





DATSUN 1000

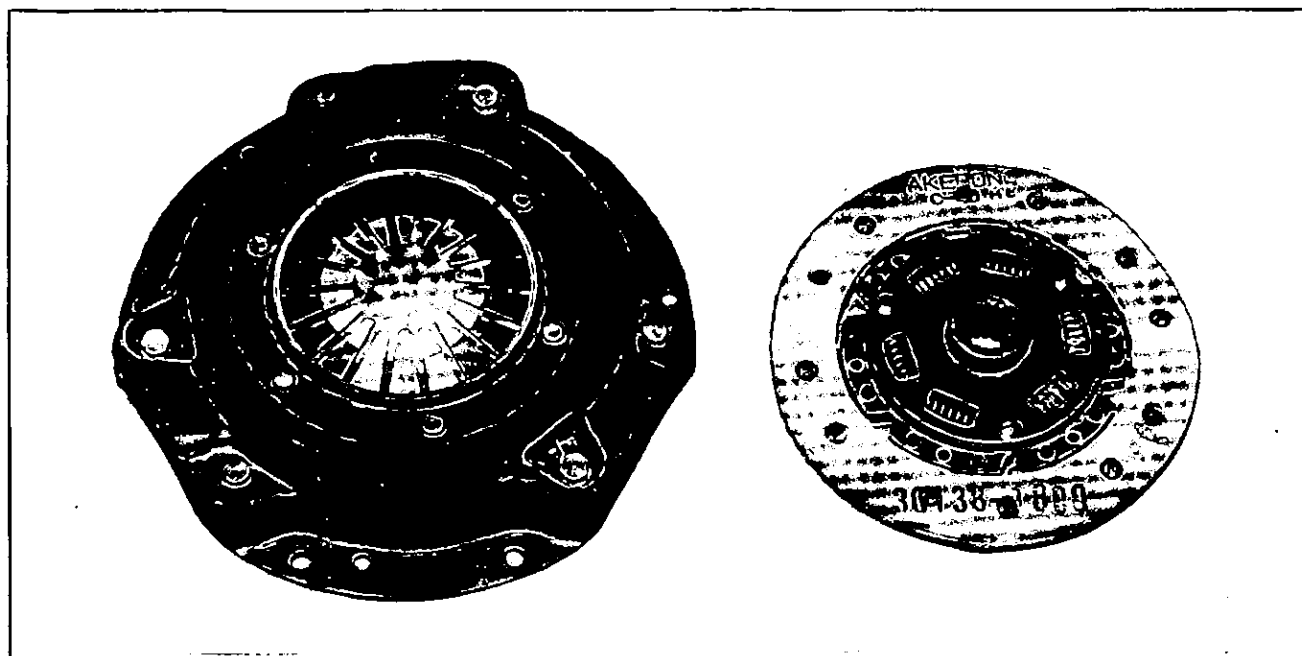


CLUTCH

Construction

The clutch mechanism is hydraulically operated for left handle drive and mechanically operated for right handle drive, and consists of

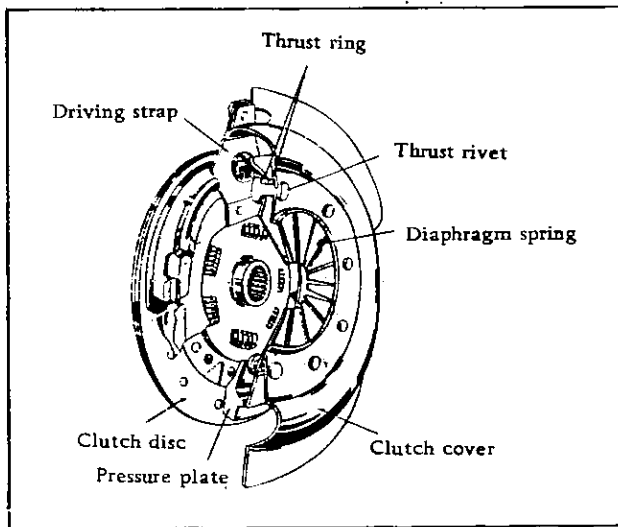
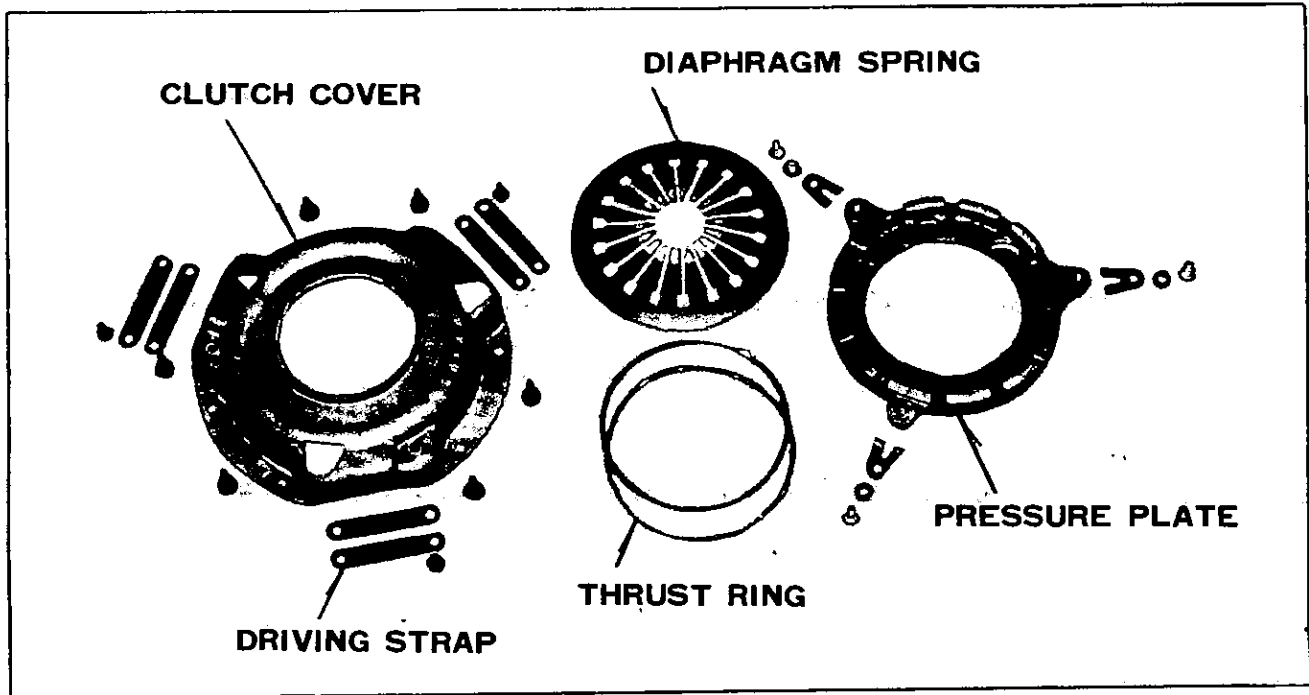
a pressure plate, a disc plate, diaphragm spring and cover assembly. The cover is bolted to the flywheel with a disc plate and pressure plate.



Spring height	31.5 mm at a position 41 ϕ on the diaphragm spring
Thickness, distance piece	7.2 mm
Wear limit of clutch facing	Less than 0.5 mm by the head of rivet
Run out, facing	Less than 0.5 mm
Play of withdrawal lever	1.5 ~ 2.0 mm
Height clutch pedal	144.5 mm
Play of clutch pedal	15 ~ 20 mm
Facing thickness	3.2 mm
Facing out dia.	160 mm
Facing inside dia.	110 mm

DATSUN 1000

The exploded view in following figure shows each of the parts.



The cover is bolted to the flywheel and encloses a disc plate, pressure plate.

Clutch Cover

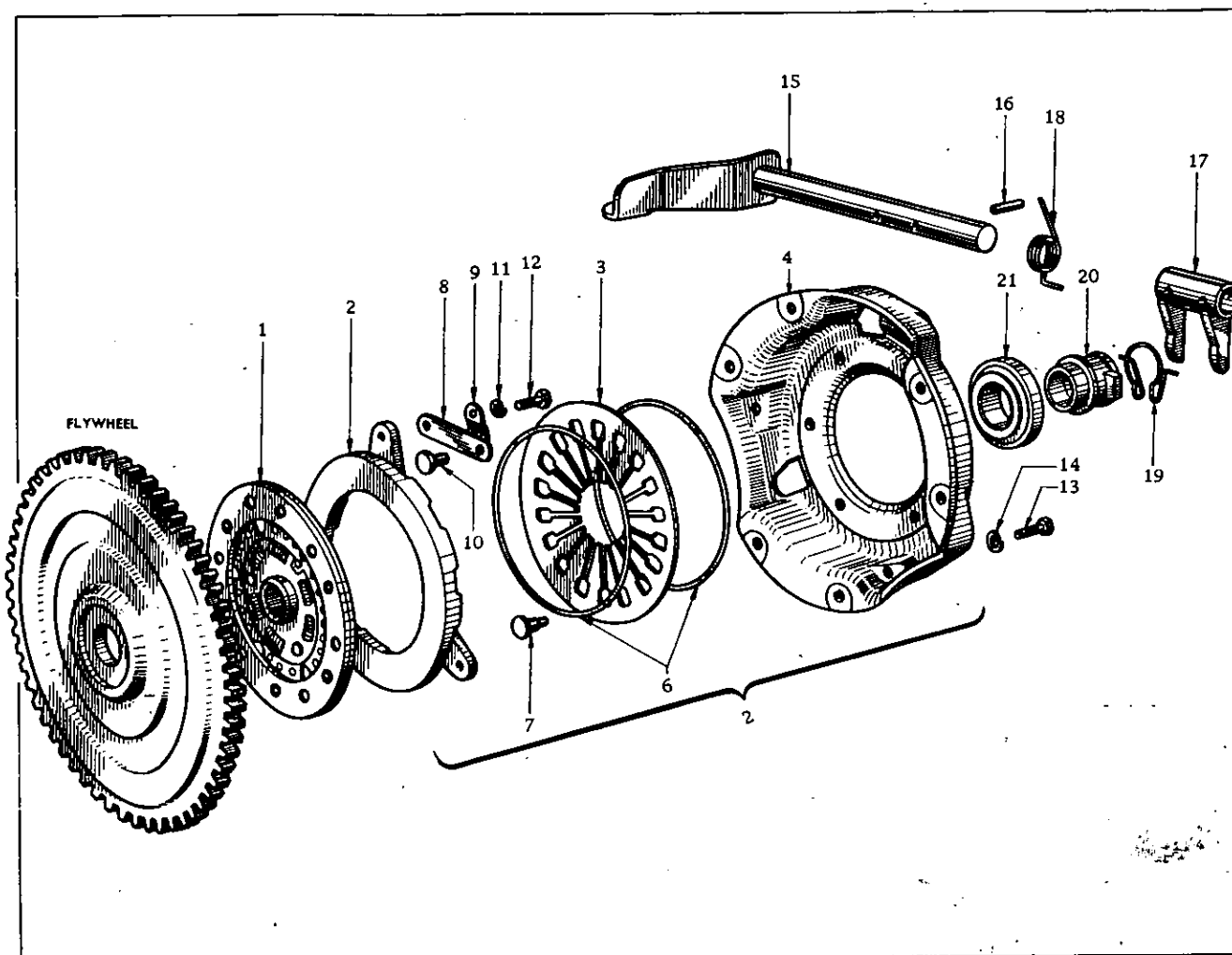
The disc plate comprises a splined hub connected to a flexible steel plate by a spring mounted.

The annular friction facings are rivetted to the plate and damper springs are assembled around the hub to absorb power shocks and torsional vibration.

The diaphragm spring is interposed between two annular rings which provide fulcrum points for the diaphragm when it is fixed.

The rings and the diaphragm are located and secured to the cover by six equally spaced rivets.

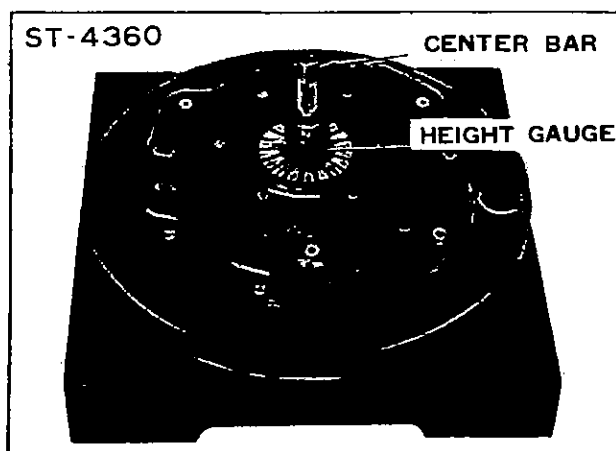
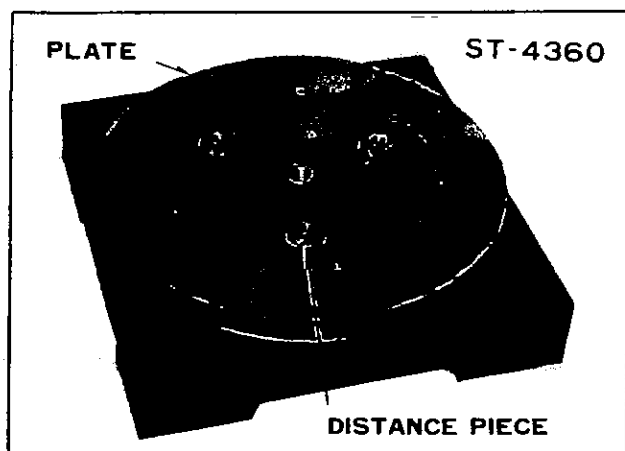
CLUTCH



Clutch

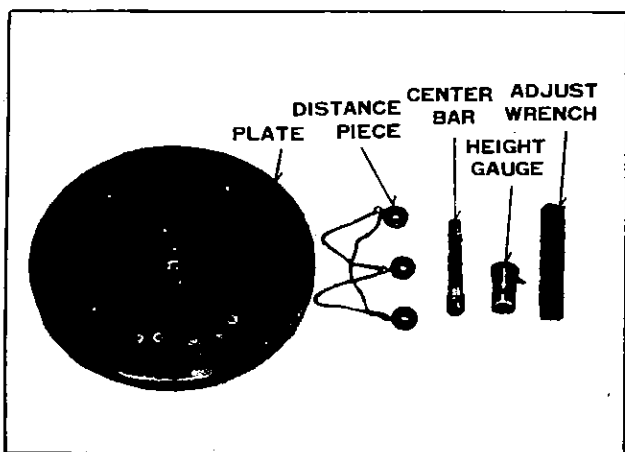
1	Ass'y-disc, clutch	12	Washer-lock
2	Ass'y-cover, clutch	13	Bolt
3	Spring-diaphragm	14	Washer-lock
4	Cover-clutch	15	Ass'y-shaft, clutch release
5	Plate-pressure	16	Pin-taper, release yoke
6	Ring-thrust	17	Yoke-clutch release
7	Rivet-thrust ring	18	Spring-return, clutch yoke
8	Plate-hanger	19	Spring-holder
9	Strap-driving	20	Sleeve-bearing, clutch release
10	Rivet-driving strap	21	Bearing-clutch release
11	Bolt		

DATSUN 1000



To adjust for clutch diaphragm spring, place the distance pieces on the base plate and set the clutch assembly on the base plate by bolts.

Screw the center bar through the height gauge.



Adjustment for operating wire type system clutch operating cylinder & master cylinder for left handle driving.

Correct and adjust the height of the diaphragm spring by adjust wrench.

Do not disassemble the pressure plate and cover body which balanced as one set.

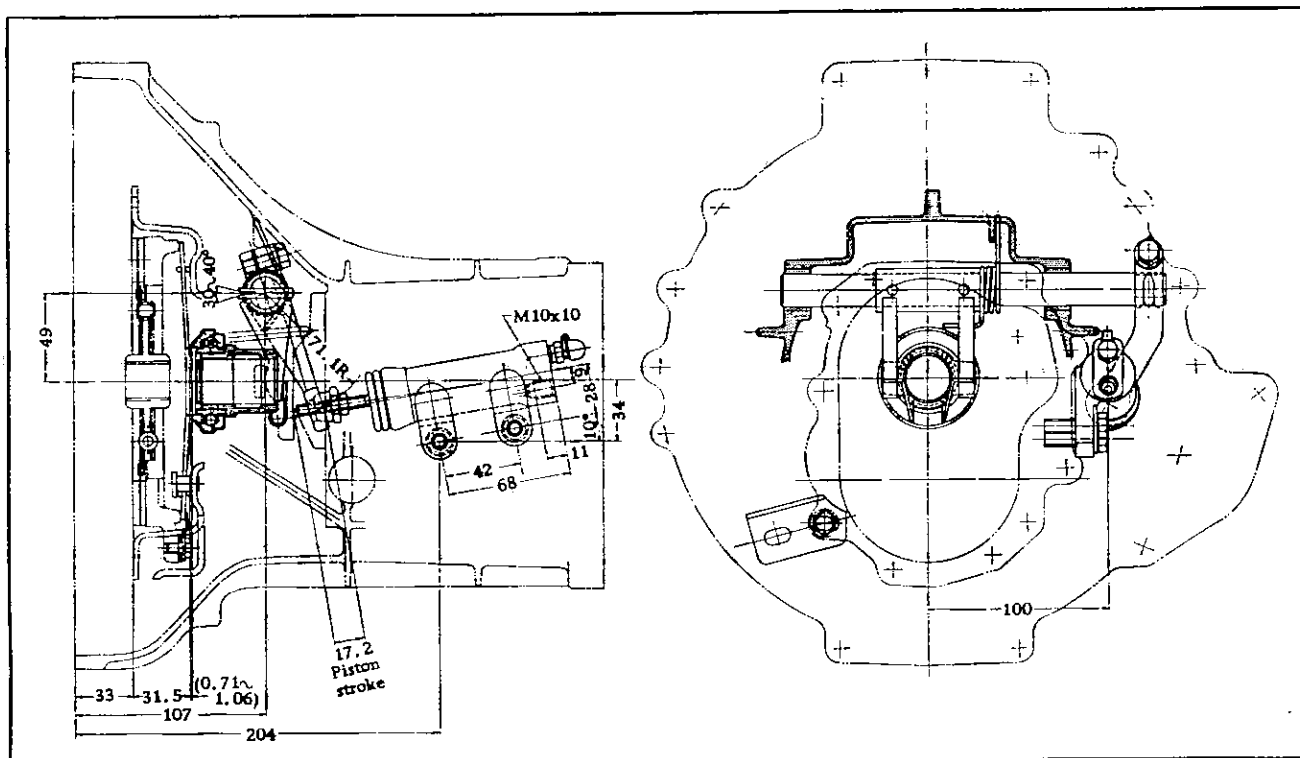
Master cyl. inside dia.	15.87 mm (5/8 in.)
Piston stroke	31.5 mm
Operating cyl. inside dia.	19.05 mm (3/4 in.)
Piston stroke	23.5 mm

This technical drawing is an exploded view of a mechanical assembly, likely a bicycle bell. The components are numbered 1 through 17. The main body (1) is a curved metal piece with a mounting bracket (3) at one end. A long, thin rod (17) is shown at the bottom, with a bracket (14) and a small pin (16) nearby. A long, thin rod (4) is shown at the top left. A curved metal piece (2) is shown in the upper middle. A long, thin rod (10) is shown in the upper right. A small pin (8) is shown in the middle. A small pin (5) is shown in the upper right. A small pin (6) is shown in the middle right. A small pin (7) is shown in the middle right. A small pin (12) is shown at the bottom left. A small pin (13) is shown at the bottom left. A small pin (15) is shown in the middle right. A small pin (16) is shown in the middle right. A small pin (17) is shown at the bottom right. A small pin (18) is shown at the bottom right. A small pin (19) is shown at the bottom right. A small pin (20) is shown at the bottom right. A small pin (21) is shown at the bottom right. A small pin (22) is shown at the bottom right. A small pin (23) is shown at the bottom right. A small pin (24) is shown at the bottom right. A small pin (25) is shown at the bottom right. A small pin (26) is shown at the bottom right. A small pin (27) is shown at the bottom right. A small pin (28) is shown at the bottom right. A small pin (29) is shown at the bottom right. A small pin (30) is shown at the bottom right. A small pin (31) is shown at the bottom right. A small pin (32) is shown at the bottom right. A small pin (33) is shown at the bottom right. A small pin (34) is shown at the bottom right. A small pin (35) is shown at the bottom right. A small pin (36) is shown at the bottom right. A small pin (37) is shown at the bottom right. A small pin (38) is shown at the bottom right. A small pin (39) is shown at the bottom right. A small pin (40) is shown at the bottom right. A small pin (41) is shown at the bottom right. A small pin (42) is shown at the bottom right. A small pin (43) is shown at the bottom right. A small pin (44) is shown at the bottom right. A small pin (45) is shown at the bottom right. A small pin (46) is shown at the bottom right. A small pin (47) is shown at the bottom right. A small pin (48) is shown at the bottom right. A small pin (49) is shown at the bottom right. A small pin (50) is shown at the bottom right. A small pin (51) is shown at the bottom right. A small pin (52) is shown at the bottom right. A small pin (53) is shown at the bottom right. A small pin (54) is shown at the bottom right. A small pin (55) is shown at the bottom right. A small pin (56) is shown at the bottom right. A small pin (57) is shown at the bottom right. A small pin (58) is shown at the bottom right. A small pin (59) is shown at the bottom right. A small pin (60) is shown at the bottom right. A small pin (61) is shown at the bottom right. A small pin (62) is shown at the bottom right. A small pin (63) is shown at the bottom right. A small pin (64) is shown at the bottom right. A small pin (65) is shown at the bottom right. A small pin (66) is shown at the bottom right. A small pin (67) is shown at the bottom right. A small pin (68) is shown at the bottom right. A small pin (69) is shown at the bottom right. A small pin (70) is shown at the bottom right. A small pin (71) is shown at the bottom right. A small pin (72) is shown at the bottom right. A small pin (73) is shown at the bottom right. A small pin (74) is shown at the bottom right. A small pin (75) is shown at the bottom right. A small pin (76) is shown at the bottom right. A small pin (77) is shown at the bottom right. A small pin (78) is shown at the bottom right. A small pin (79) is shown at the bottom right. A small pin (80) is shown at the bottom right. A small pin (81) is shown at the bottom right. A small pin (82) is shown at the bottom right. A small pin (83) is shown at the bottom right. A small pin (84) is shown at the bottom right. A small pin (85) is shown at the bottom right. A small pin (86) is shown at the bottom right. A small pin (87) is shown at the bottom right. A small pin (88) is shown at the bottom right. A small pin (89) is shown at the bottom right. A small pin (90) is shown at the bottom right. A small pin (91) is shown at the bottom right. A small pin (92) is shown at the bottom right. A small pin (93) is shown at the bottom right. A small pin (94) is shown at the bottom right. A small pin (95) is shown at the bottom right. A small pin (96) is shown at the bottom right. A small pin (97) is shown at the bottom right. A small pin (98) is shown at the bottom right. A small pin (99) is shown at the bottom right. A small pin (100) is shown at the bottom right.

-
- Adjust end play 1.5~2.0 mm at this point and then tighten the lock nut

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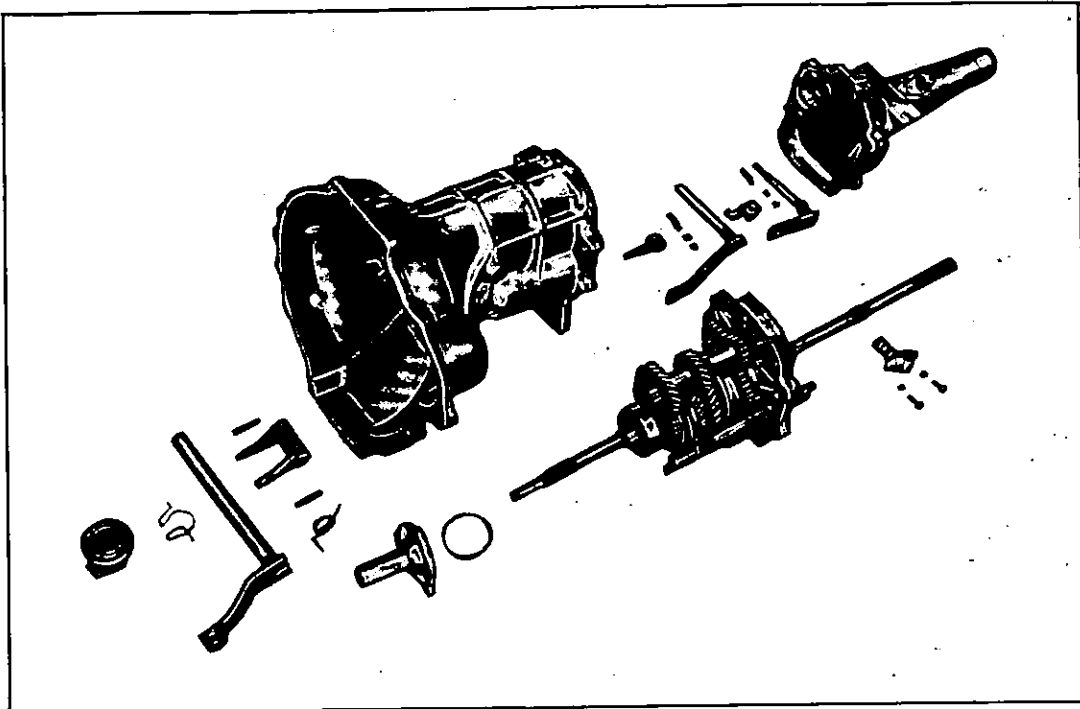
DATSUN 1000



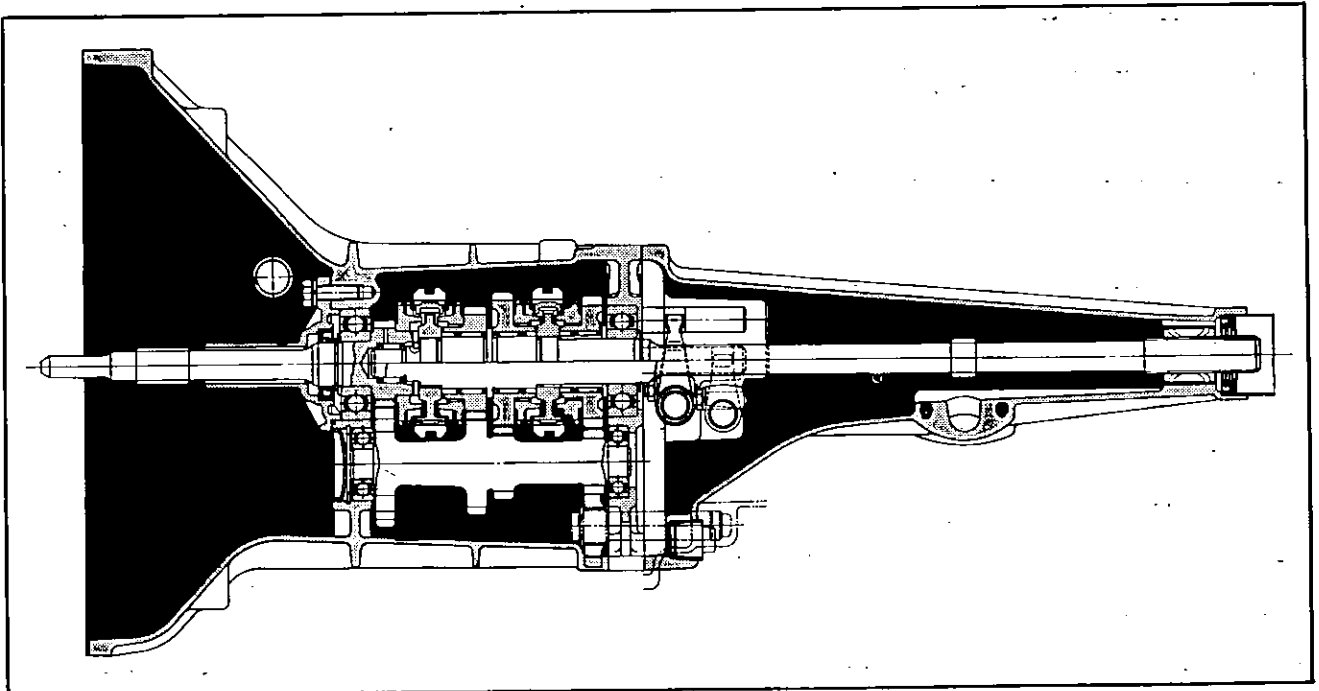
Clutch Operating Cylinder & Master Cylinder for Left Handle



TRANSMISSION



Components of Transmission



Sectional View of Transmission

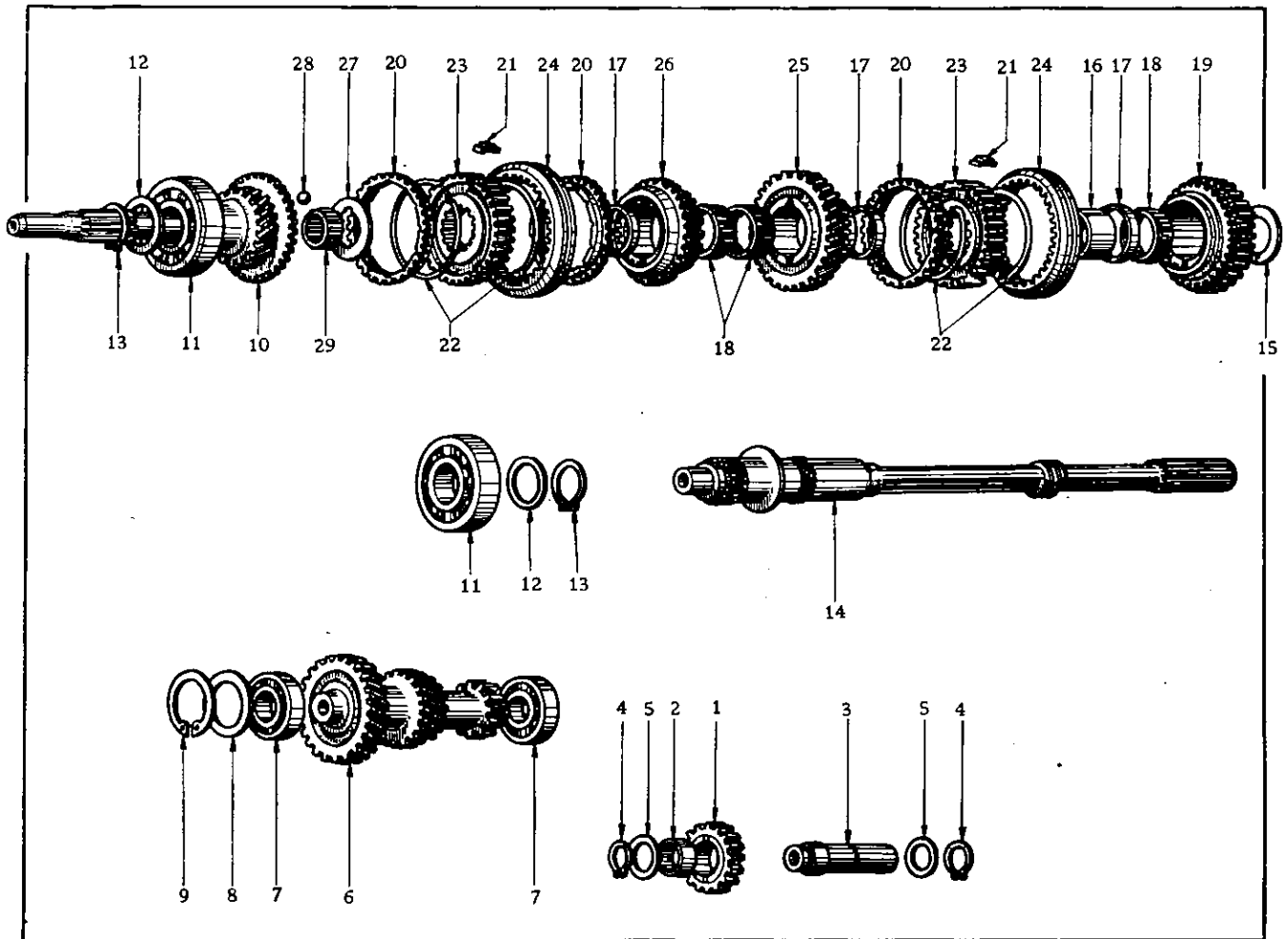
DATSUN 1000

Model	3 stage for forward, 1 stage for reverse Remote control Full-synchromesh on forward gears.	4 stage for forward, synchromesh on for speed
Type of gear	Synchromeshed helical gear type	#2nd, 3rd & 4th gear
Ratio #1	3.38	3.76
Ratio #2	1.73	2.17
Ratio #3	1.00	1.40
Ratio #4		1.00
Reverse	3.64	3.64
Final gear ratio	4.11 : 1	4.375 : 1 (van)

Back lash of each meshing gear	0.05 ~ 0.1
Gear ratio of speed meter	Main drive gear counter driven gear, second gear and first gear 4.00 (16/4)
MAIN DRIVE GEAR Main drive gear Nos.	19
MAIN SHAFT Second gear Nos. First gear Nos. Reverse gear Nos. Reverse gear thrust clearance First gear thrust clearance Second gear thrust clearance Front gear thrust clearance Clearance between boulk ring & each gear Cover adjusting shim Bearing type of spline	25 31 31 0.15 ~ 0.25 mm 0.15 ~ 0.25 mm 0.1 ~ 0.3 mm 0.1 ~ 0.35 0.8 ~ 1.45 mm 0.5, 0.2, 0.1 mm (Front) Ball bearing (Rear) Bushing
COUNTER GEAR SHAFT Driven gear teeth Nos. Counter gear teeth Nos. First gear teeth Nos. Reverse gear Clearance of front thrust Thrust washer size Bearing type of spline	29 22 14 13 0.02 ~ 0.08 mm 0.8, 0.9, 1.0, 1.1, 1.2, 1.3 mm Front & rear ball bearing
REVERSE IDLER Gear teeth Nos. Clearance between shaft & bushing Clearance between gear & adapter plate Clearance to snap ring	17 0.032 ~ 0.077 0.1 ~ 0.5 0.1 ~ 0.4
FORK SHIFT Length of locking ball spring	16.4 mm at 7 kg

TRANSMISSION

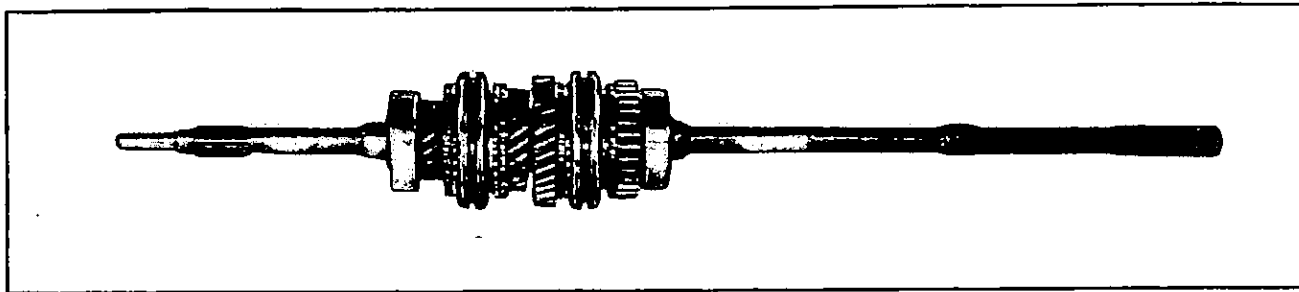
Assembling Order of Main Shaft



Transmission Gear

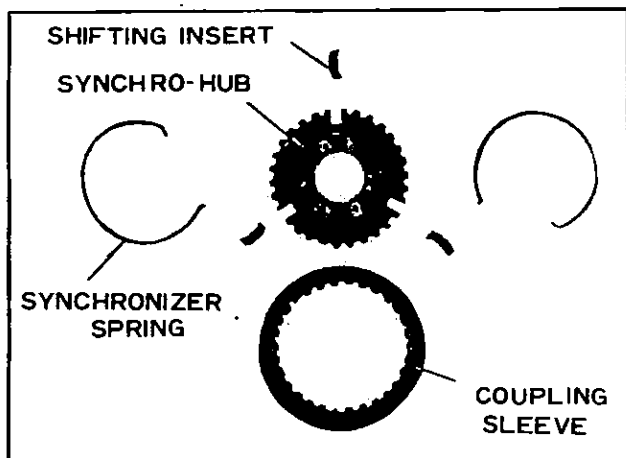
1	Ass'y-gear, reverse idler	15	Washer-thrust, main shaft
2	Bushing-gear, reverse idler	16	Bushing-main shaft, reverse gear
3	Shaft-reverse idler	17	Spacer-needle bearing
4	Ring-map, reverse idler	18	Bearing-needle, main shaft
5	Washer-thrust, reverse idler	19	Ass'y-gear, reverse, main shaft
6	Ass'y-gear, counter	20	Ring-baulk
7	Bearing-ball, counter shaft	21	Insert-shifting
8	Washer-adjusting, counter bearing	22	Spring-synchronizer
9	Ring-map, counter bearing	23	Hub-synchronizer
10	Ass'y-gear, main drive	24	Sleeve-coupling
11	Bearing-ball, main shaft	25	Ass'y-gear, 1st speed
12	Washer-main bearing	26	Ass'y-gear, 2nd speed
13	Ring-map, main drive gear & main shaft	27	Washer-thrust, synchronizer hub
14	Shaft-main	28	Ball-steel
		29	Bearing-pivot, main shaft

DATSUN 1000

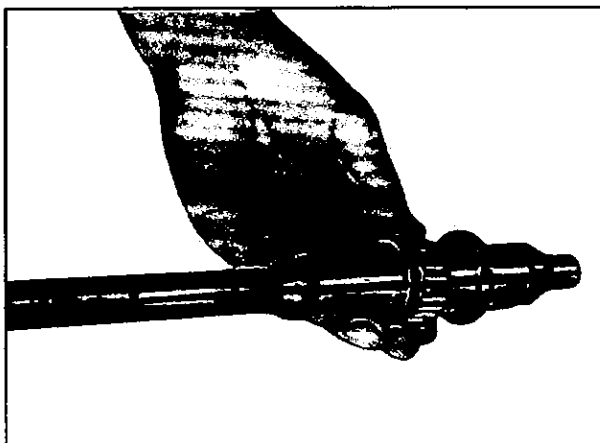


Assembling Order Through the Main Shaft

Assemble the Coupling Sleeve to
Synchro-hub

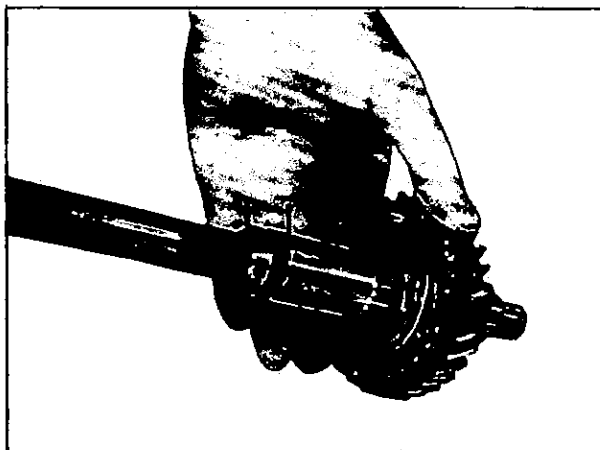
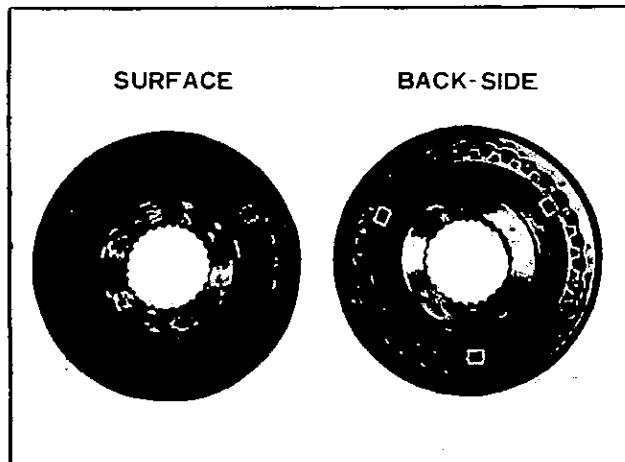


Assemble the needle bearing and bearing
sleeve to rear side of the main shaft.



To Apply Gear Oil

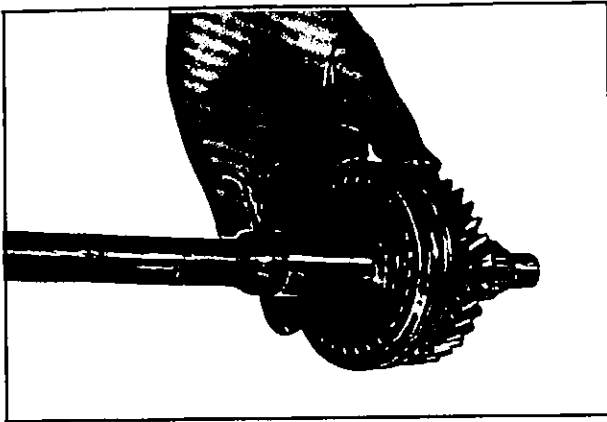
Set up the main shaft gear & baulk ring as
shown.



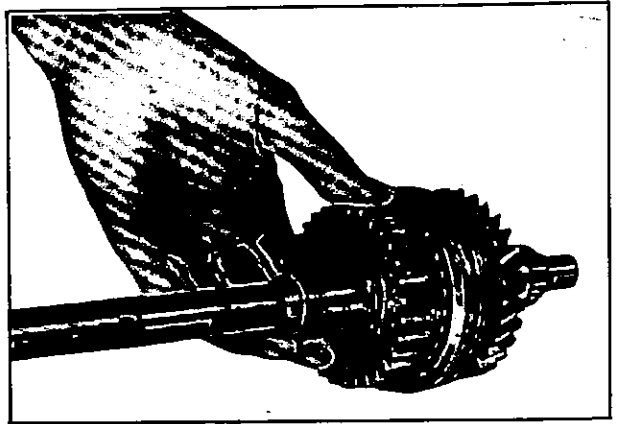
To Apply Cup Grease

TRANSMISSION

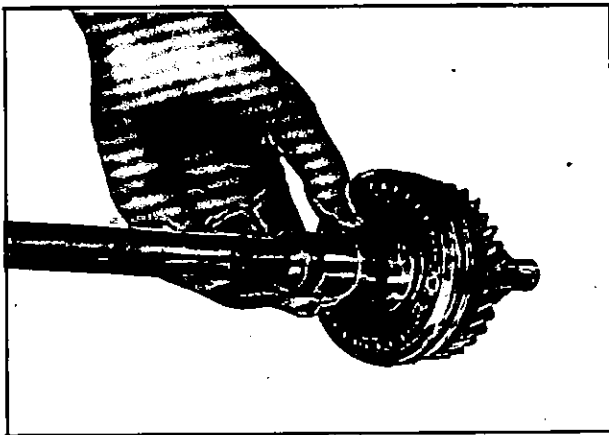
Insert the synchro-hub fitting shifting insert to groove of baulk ring.



Insert the reverse gear and thrust washer.



Insert the main shaft bush of reverse speed.

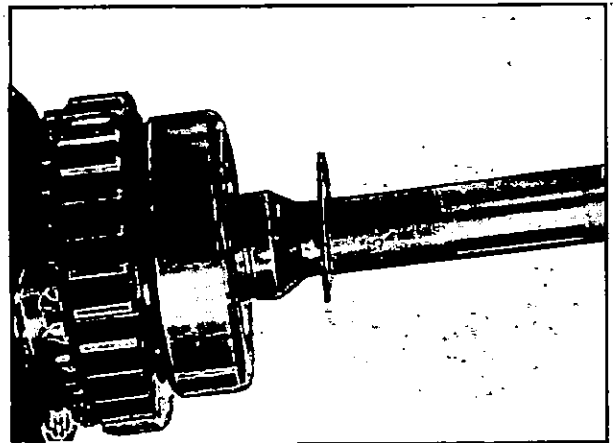
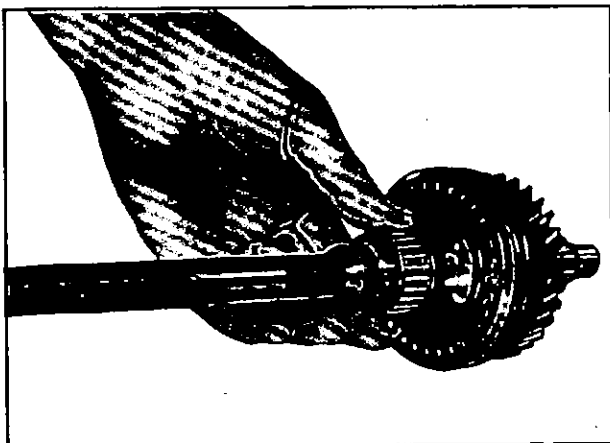


Press the main bearing from rear side of the main shaft and then insert washer and snap ring.

Inspect Back Lash About Assembled One

First gear and main shaft. Reverse gear and thrust washer.

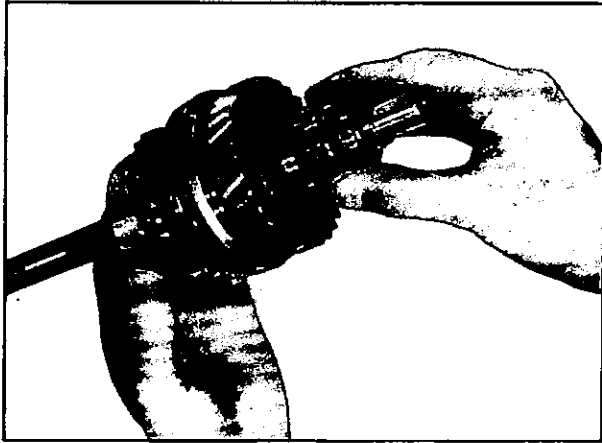
Put the needle bearing spacer and bearing by order.



To Somer Gear Oil for Needle Bearing

DATSUN 1000

Set up the needle bearing and needle bearing spacer from front of main shaft.

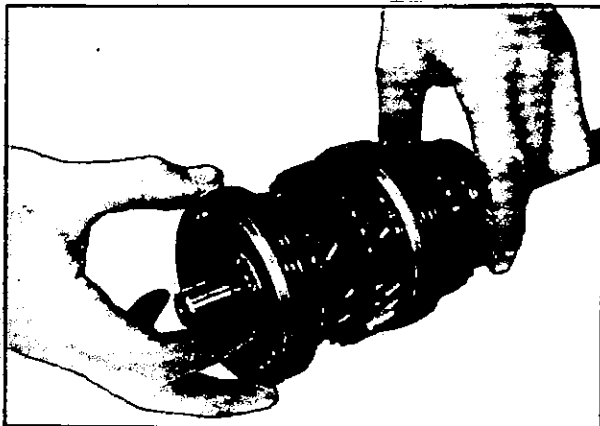


Apply Gear Oil

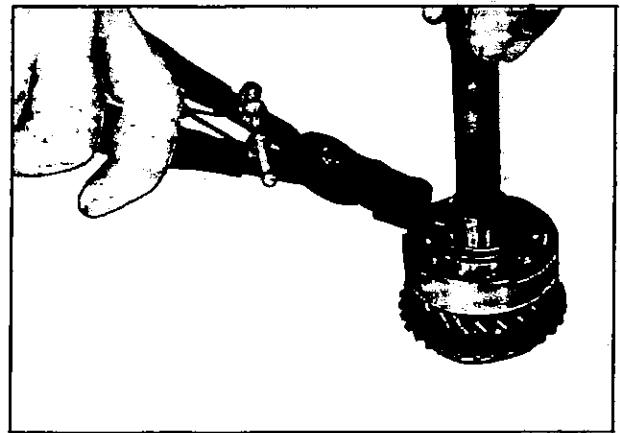
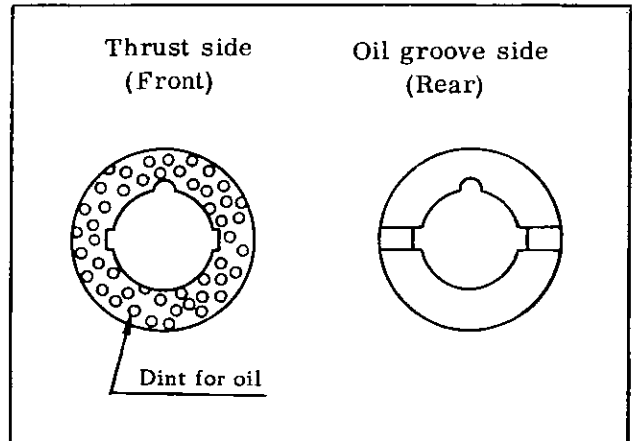
Put the second gear and baulk ring on the shaft.



*To Smear Cup Grease for
Inside of Baulk Ring*

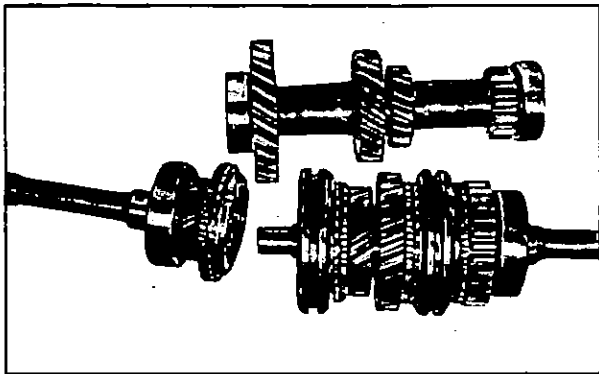
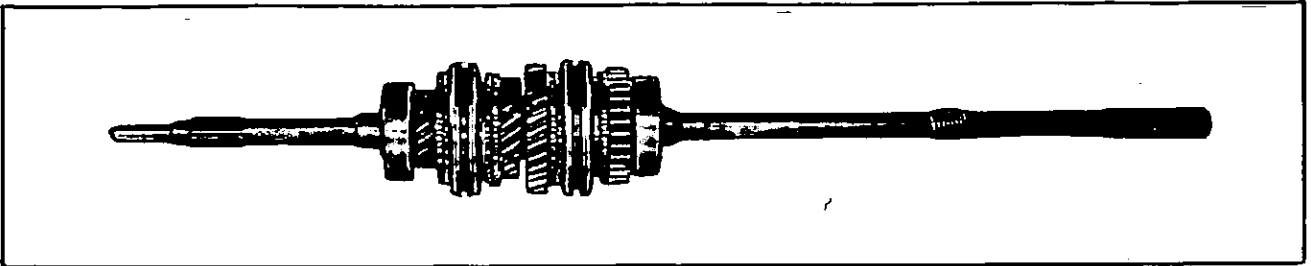


Insert the synchro-hub fitting the shifting insert for groove of baulk ring.

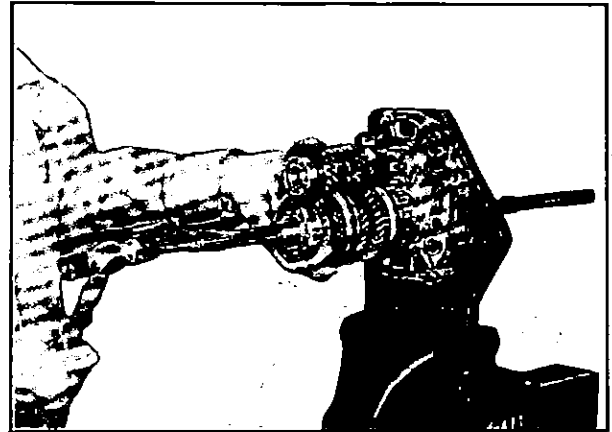


Insert steel ball, thrust washer of synchro-mesh hub and then pilot bearing.
To smear grease for dint of washer.
Press the main bearing to the main drive gear (front). Put the washer of main bearing washer and snap ring.

TRANSMISSION

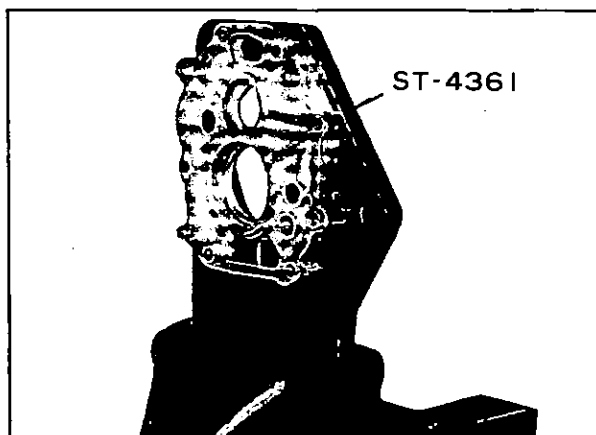


Tap and set the main shaft with wooden hammer fitting the center of counter bearing after inserting main bearing rear into the hole of plate.

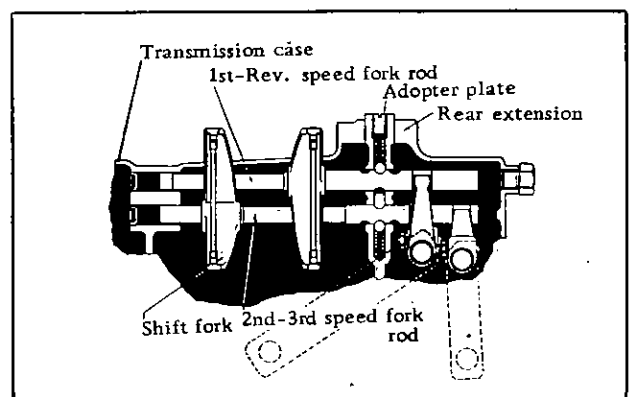


Assembling

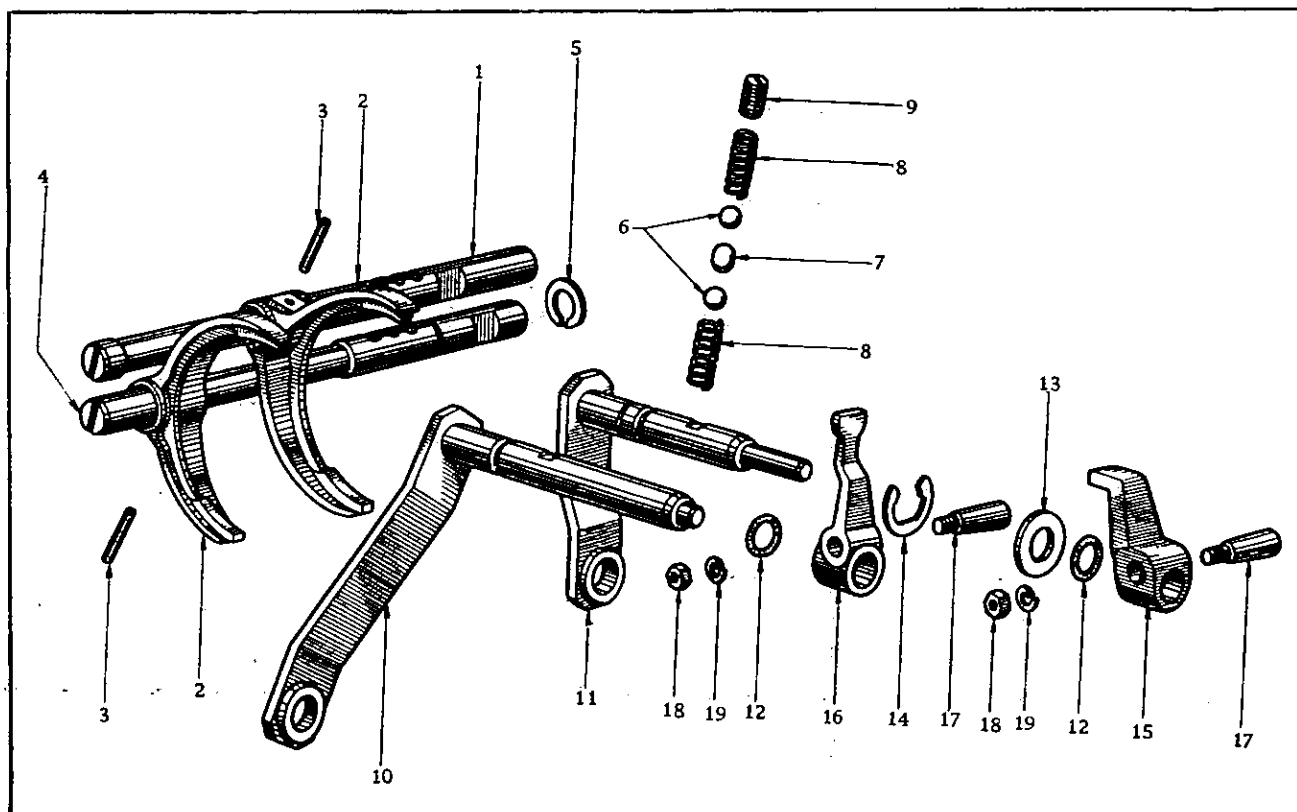
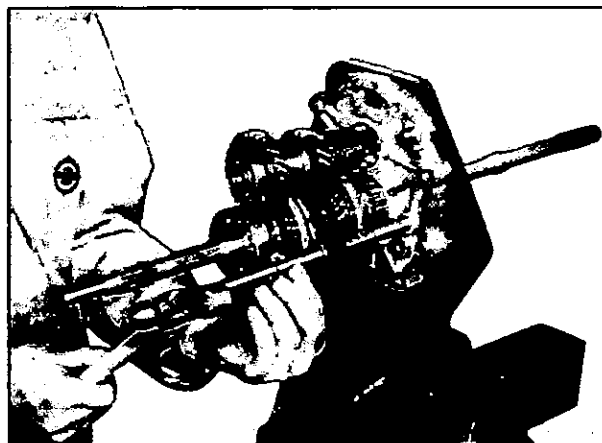
Hold the adapter plate on the bench(ST-4361).



Fix the shift fork for each rod.



Set the main shaft assembly and counter shaft fitting with gears each other as shown.

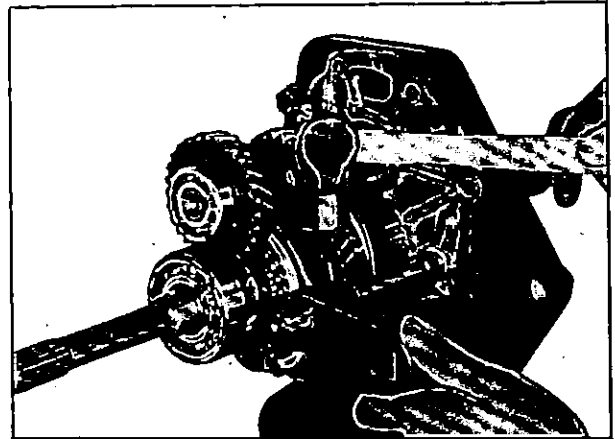
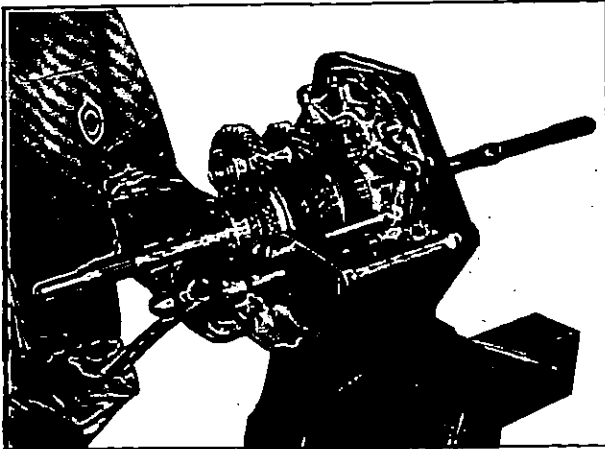


Transmission Gear Shifting

1	Rod-fork, reverse & 1st	11	Comp.-shaft, cross, 2nd & 3rd
2	Fork-shift	12	Ring-"O", cross shaft
3	Pin-retaining, fork	13	Washer-thrust, cross shaft
4	Rod-fork, 2nd & 3rd	14	Ring-"E", cross shaft
5	Ring-stopper	15	Lever-operating, 2nd & 3rd speed
6	Ball-checking	16	Lever-operating, 1st & reverse speed
7	Plunger-inter lock	17	Pin-retaining
8	Spring-checking ball	18	Nut
9	Plug-checking	19	Washer-lock
10	Comp.-shaft, cross, 1st & reverse		

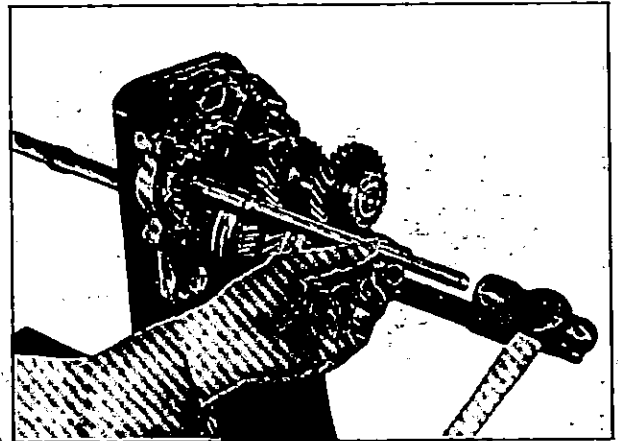
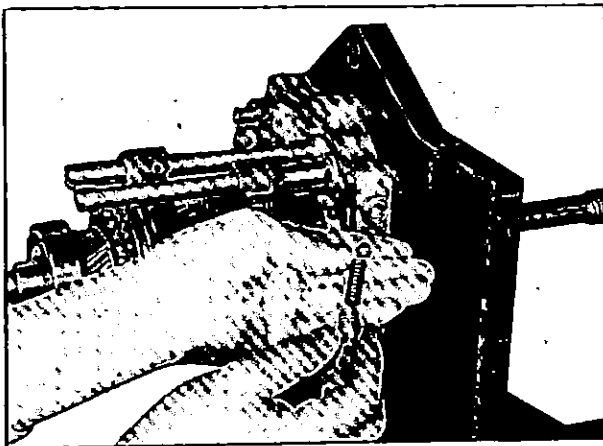
TRANSMISSION

To fix the second, third speed fork rod after setting check balls and springs.



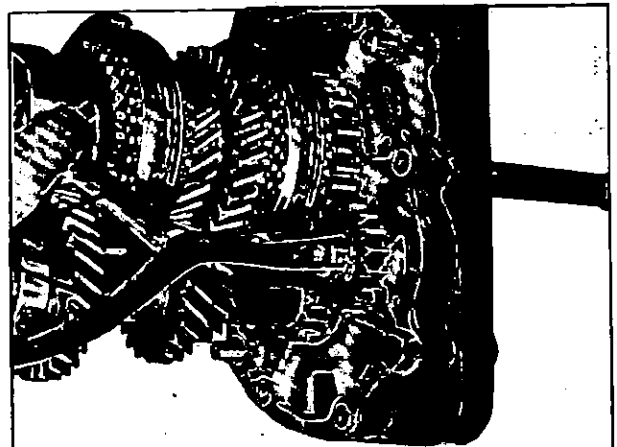
Inserting the reverse idler gear and thrust washer and set them up by tapping with a brass bar these gears should be neutral position in this procedure.

Set the stopper link and inter lock plunger.
Fix the first, reverse and speed fork rod.
Insert the check ball and check ball spring into the plug hole and set it.



Screw the plug up to level against the plate edge.

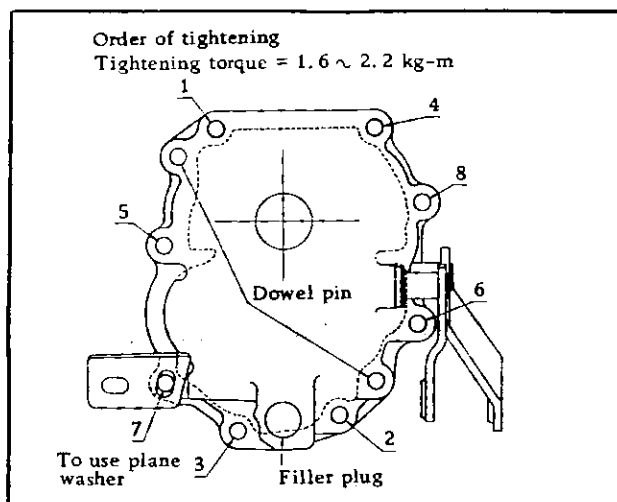
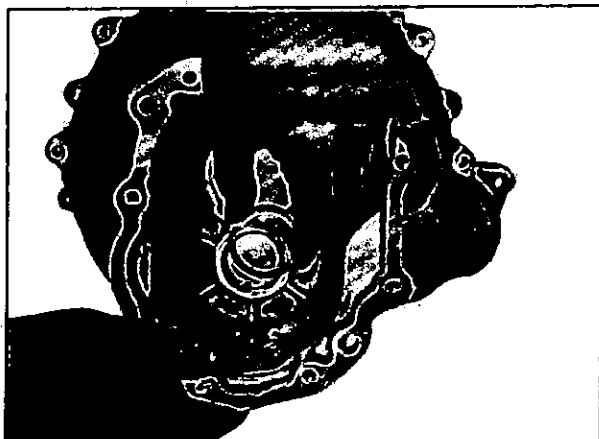
Tapping the retain pin of shift fork and fix the adopter plate as finding the hole of reverse idler shaft as upper side.



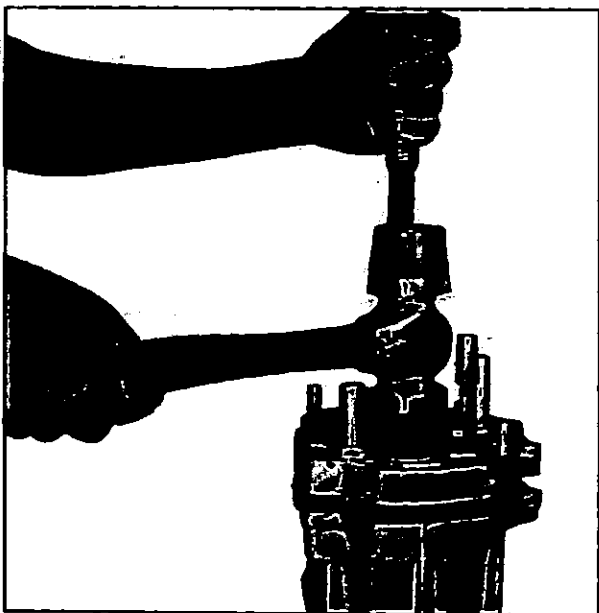
DATSUN 1000

Fix the reverse idler shaft with thrust washer and snap ring for front and rear side. (Back lash of idler gear and washer 0.1 ~ 0.5 mm).

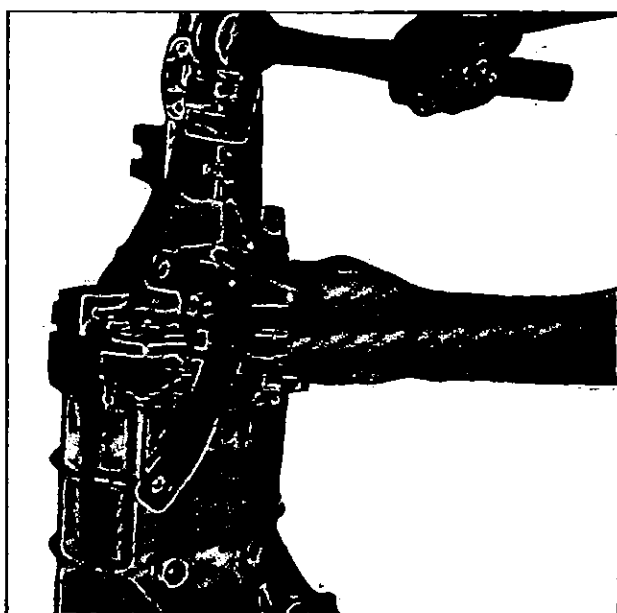
Put the case of transmission back side up.



Fix the washer of counter bearing and set up the adopter plate to the gear box.

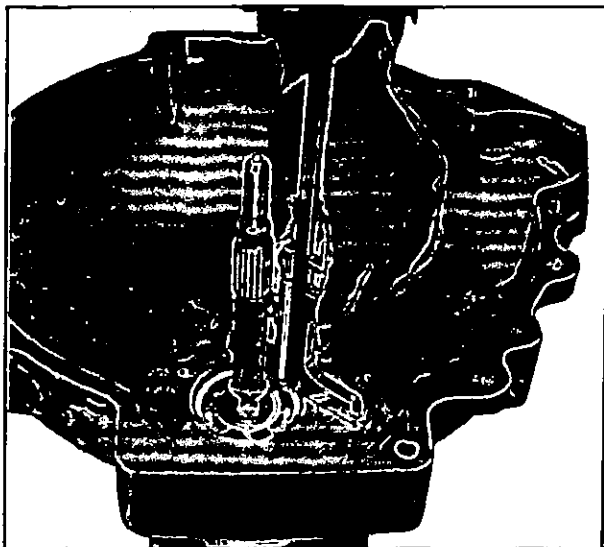


Complete with rear extension to the gear box by fix bolts.



TRANSMISSION

Select the shims for front cover.



Front cover adjusting shims

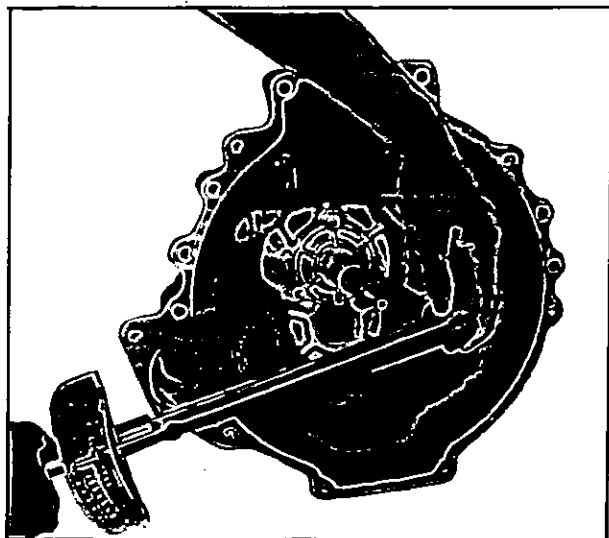
Depth from fixed face of the front cover to end face of outer race of main bearing.

Part No.	Thickness	
32208-18000	0.5	5 mm \pm 0.15 0
32208-18001	0.2	
32208-18002	0.1	

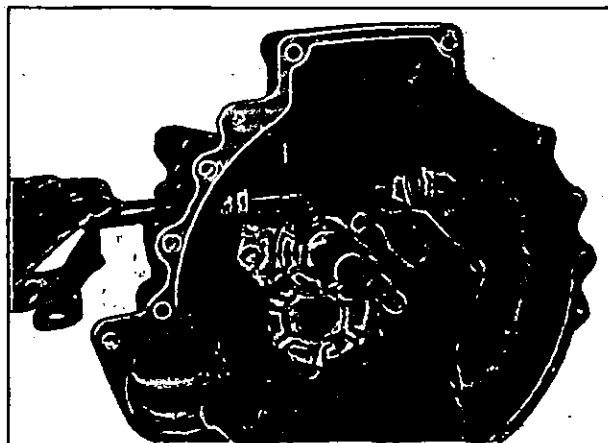
Set the oil seal with "O" ring and adjusting shim to front cover.

Tightening torque = 1.0 ~ 1.4 kg-m

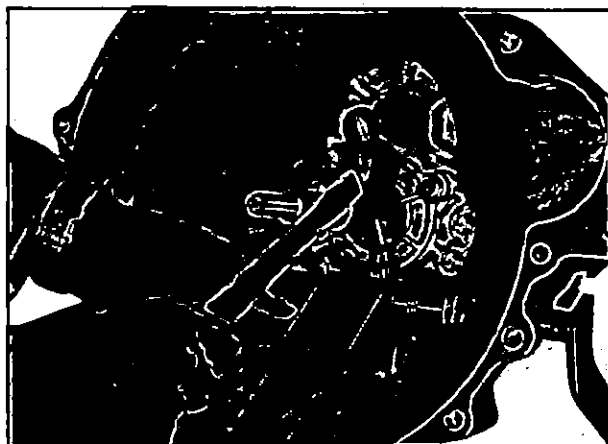
To apply cup grease for lip of oil seal.



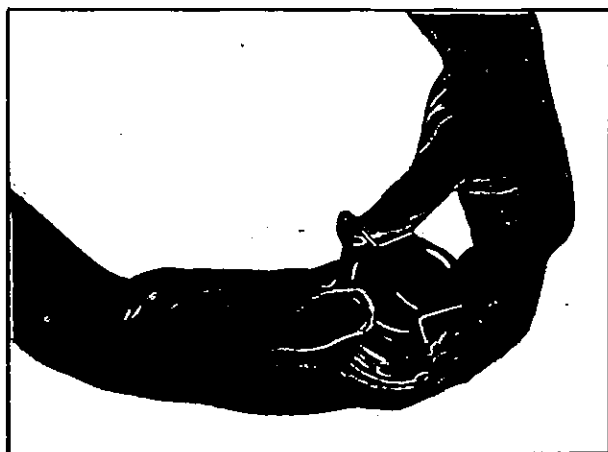
Assemble the return spring and clutch release yoke.



Fix the taper pin to the yoke.



Press the release bearing into the sleeve and complete the release bearing assembly with holder.

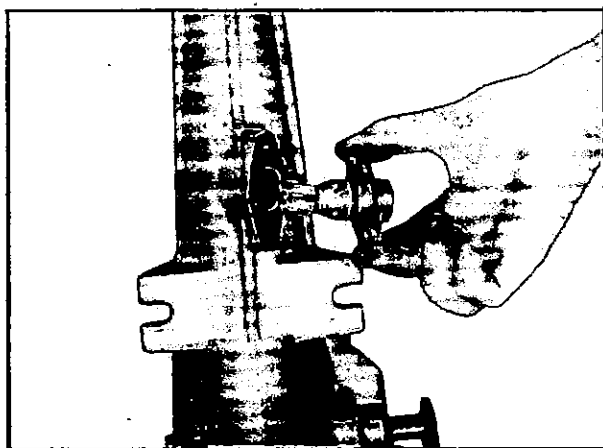


DATSUN 1000

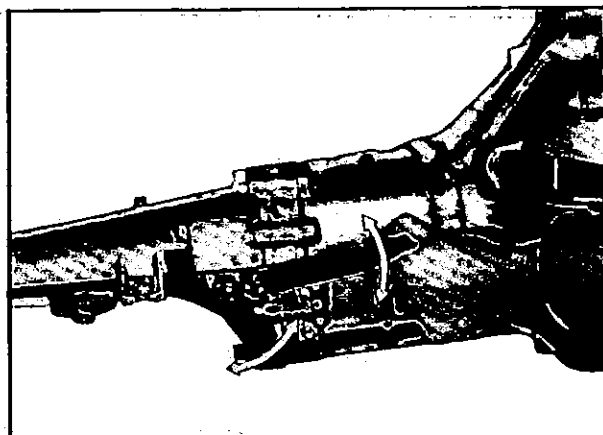
Fix the sleeve to front cover.



Insert the pinion gear assembly of speed meter.



To smear cup grease on the teeth to confirm about condition of main drive gear and main shaft.

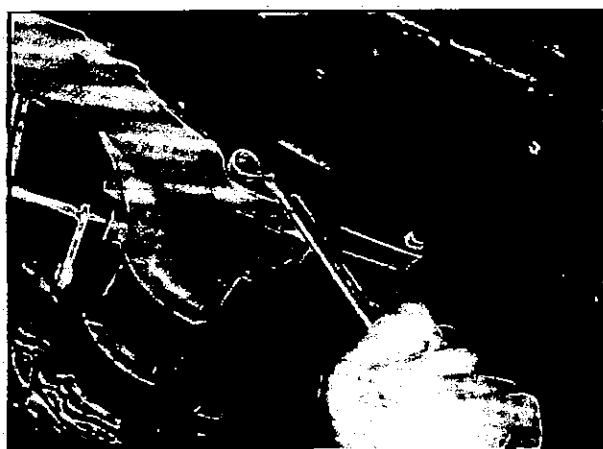


Dismounting the Transmission Assembly from the Car

- Disconnect the front tube of muffler.
- Drain gear oil from the case of transmission.
- Disconnect speedometer cable.
- Detach the propeller shaft.
- Disconnect remote control linkage and side lever of transmission.



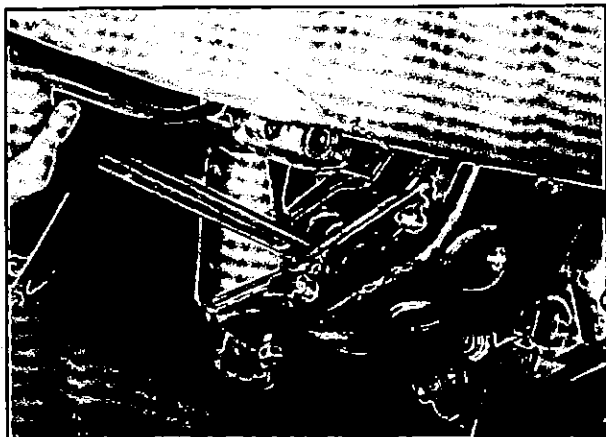
- Separate clutch operating wire and withdrawal lever.
- Take off the starting motor.
- Disconnect the plate of dust sealed.



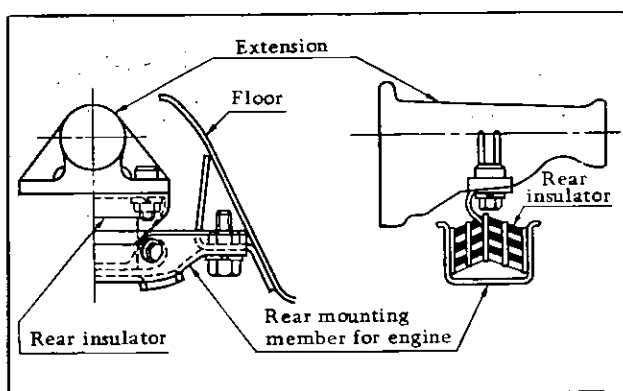
- Jack up the body of transmission.
- Unscrew fixing bolts to the engine block.

TRANSMISSION

- Unscrew the rear engine mounting bolts, rear extension bolt and cross member.



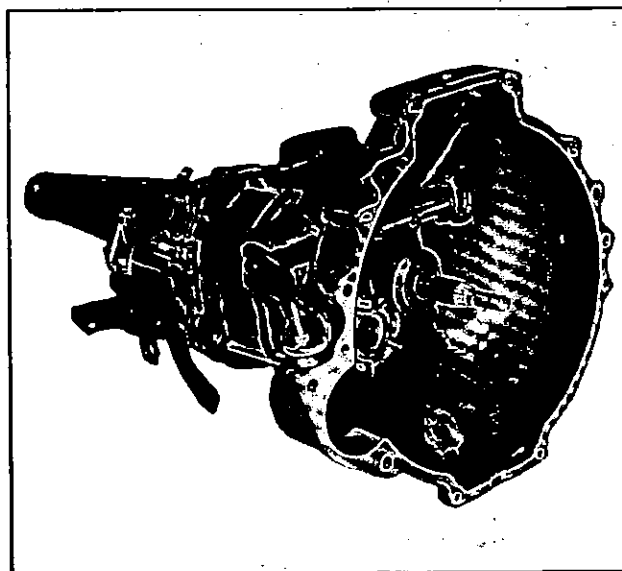
Pull out gradually to rear way after detaching the mounting.



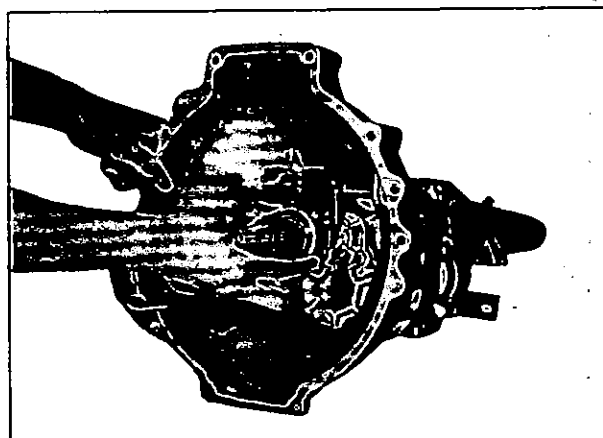
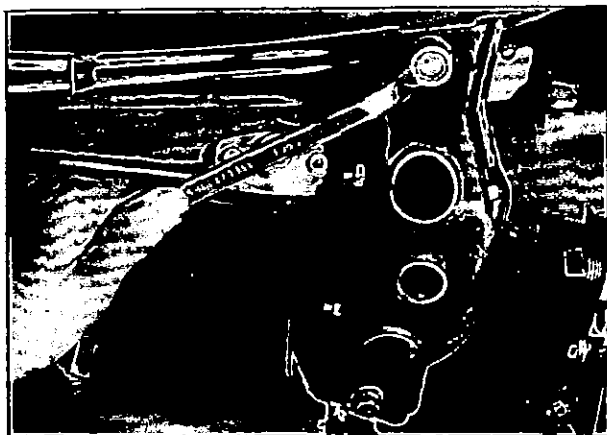
Mounting of transmission is a reversal of dismounting way.

Disassembly

A. The Case of Transmission

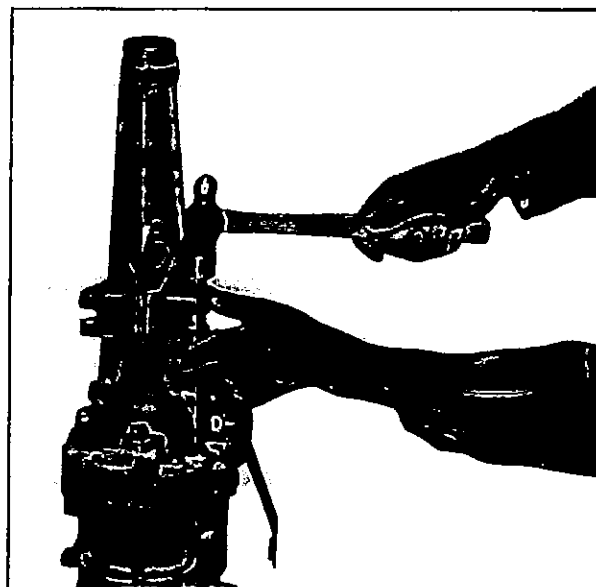


Take off the pinion sleeve of speedometer and pull out the pinion sleeve assembly.

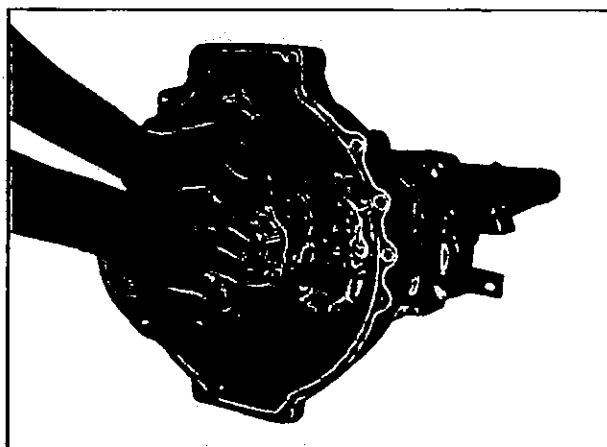


DATSUN 1000

Detach the rear extension assembly from the adapter plate.



Separate the adapter plate with main shaft assembly and counter shaft complete from the transmission case. (To confirm the numbers of used washers at the front of counter shaft for reassembling case.)

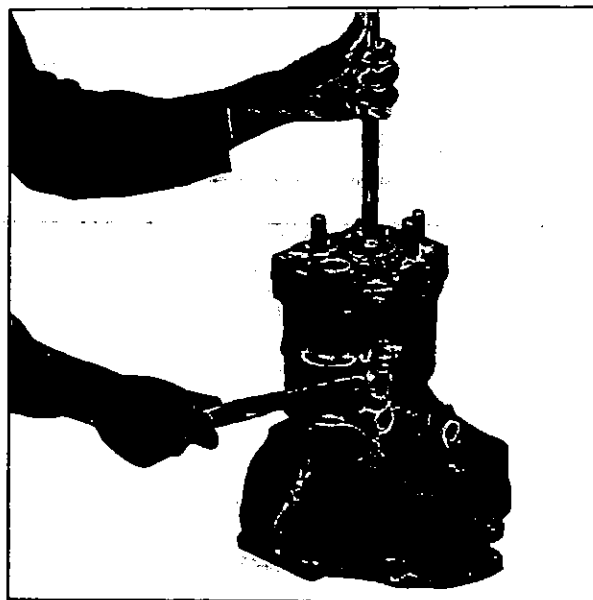


Disconnect the holder spring of bearing sleeve at the release yoke and take out the sleeve with spring.

Knock out the release shaft after pulling the taper pin.

Take out the adjusting shims and "O" ring of front cover.

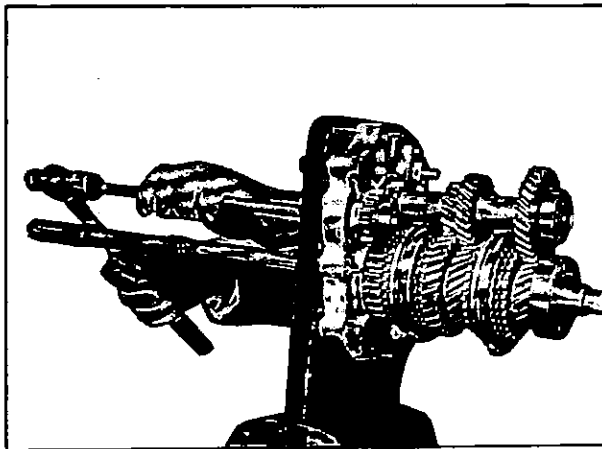
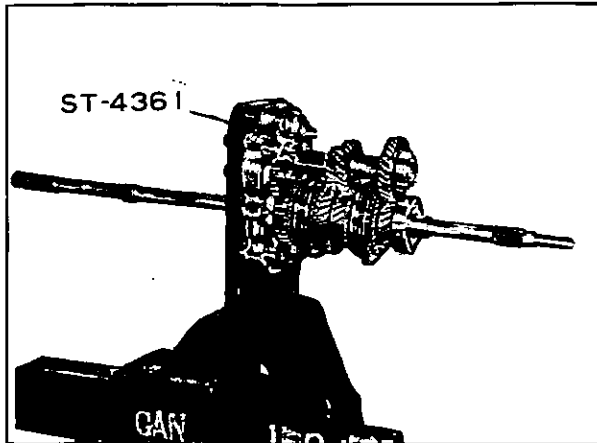
(To confirm numbers of used shims for reassembling case.)



TRANSMISSION

B. Main Shaft

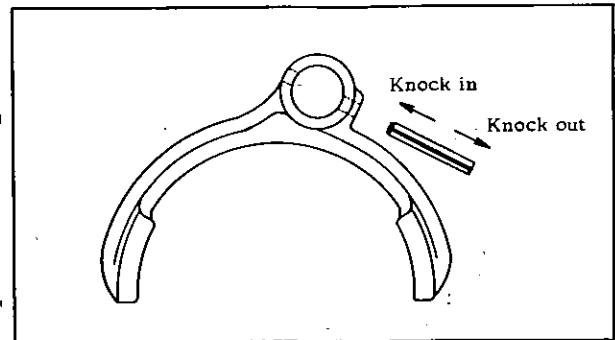
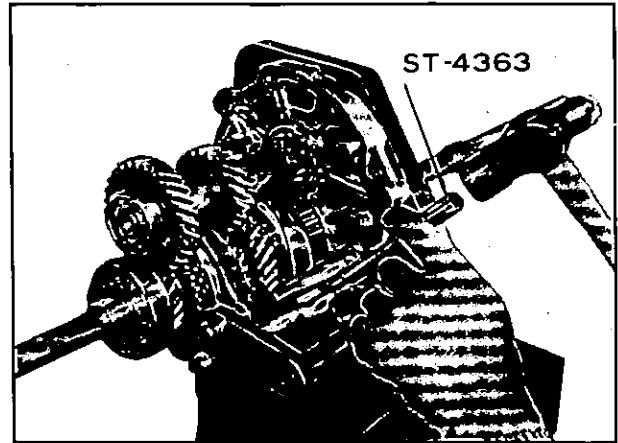
Fix the adapter plate with the counter shaft assembly and the main shaft assembly as shown the figure.



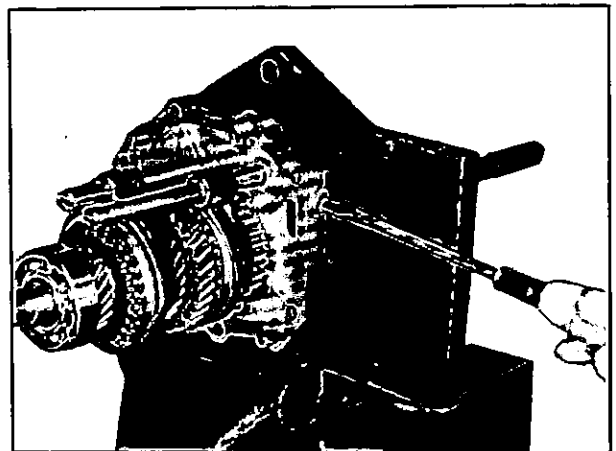
Detach the snap ring (2) at the reverse idler shaft and tap out the shaft by the brass bar.

Detach the reverse idler gear and thrust washer (2) from shaft at neutral position.

Fix the adapter plate assembly on the bench as shown the figure and knock out the retaining pins from the boss by tool. (ST-4363)

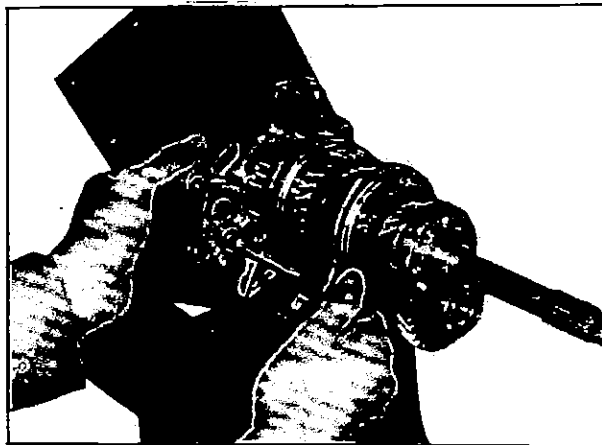
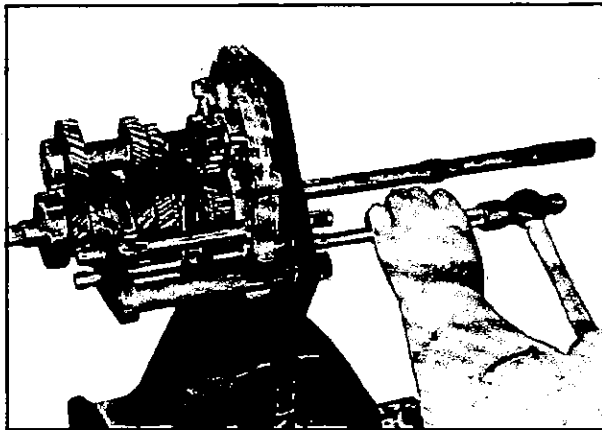


Take out check ball and spring from the plug.

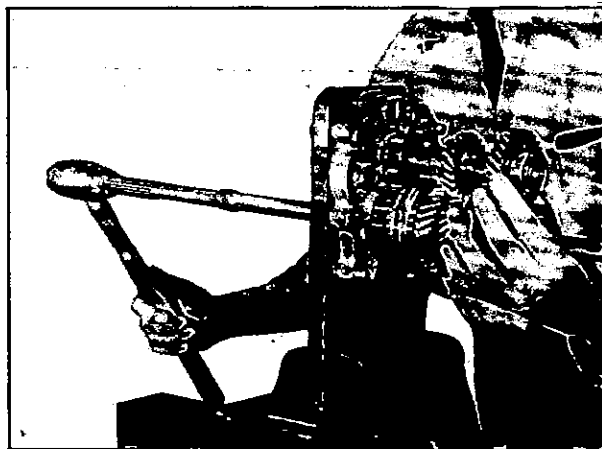


DATSUN 1000

Detach low, reverse and speed fork rod by the brass bar.



Disassemble inter lock plunger and pull out the second, third and speed fork.

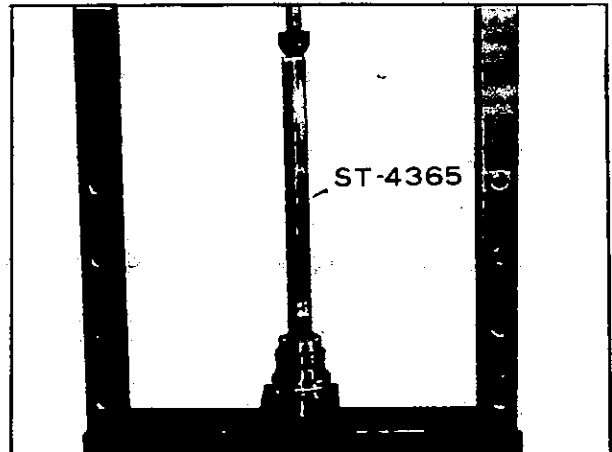


Detach the main shaft assembly and counter shaft complete from the adapter plate.

Separate the main drive gear and main shaft.

Detach the pilot bearing, synchro-hub thrust washer, steel ball, synchro-hub with cup ring sleeve, baulk ring, main shaft second gear and needle bearing etc. from the main shaft.

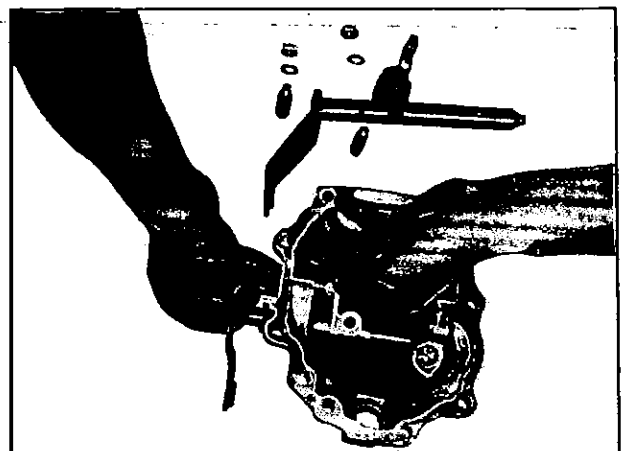
Take out main bearing washer, main bearing (rear side) from main shaft after detaching snap ring.



Draw out main shaft thrust washer, reverse speed gear, main shaft needle bearing, needle bearing spacer, reverse, speed, main shaft bush, synchro-hub with cup ring sleeve, baulk ring main shaft low gear, needle bearing spacer and main shaft needle bearing etc. from rear side.

C. Rear Extension

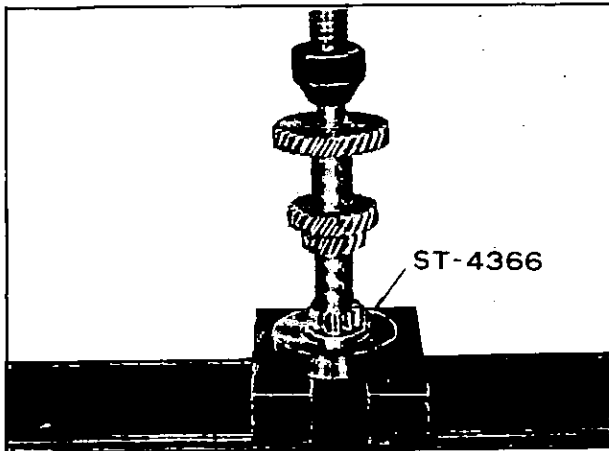
Disconnect the cotter pin of low reverse and second, third speed operating lever and take out operating lever by pulling the cross shaft out.



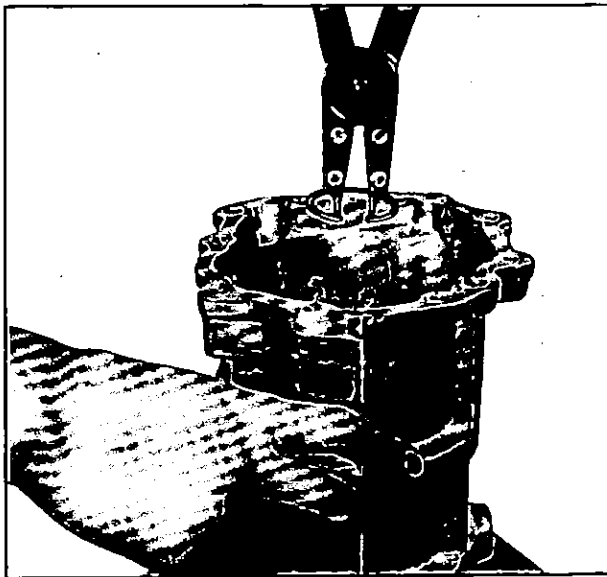
TRANSMISSION

Setting Counter Bearing Washer

- a) Press the ball bearings into front and rear of the counter gear cluster.



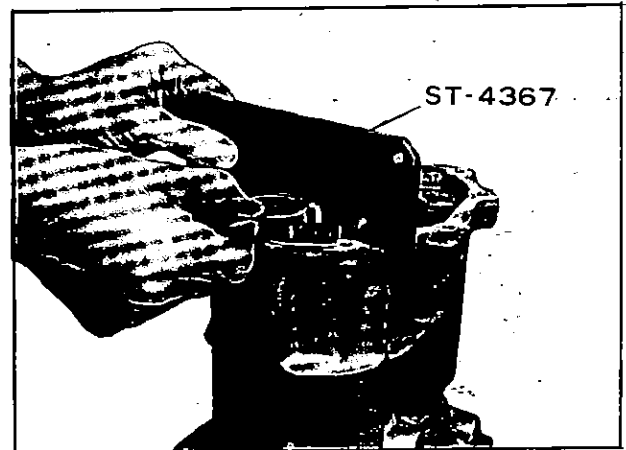
- b) Assemble the snap ring for the transmission case and set temporarily the counter gear cluster to the transmission case.



- c) The outer race should be inserted surely to close for snap ring and gauge the clearance for the bearing by a service tool.

Counter-bearing washer

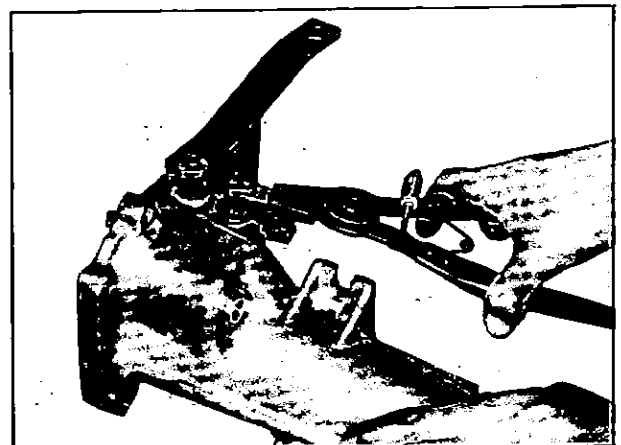
Part No.	Thickness mm
32224-18001	0.8
32224-18002	0.9
32224-18003	1.0
32224-18004	1.1
32224-18005	1.2
32224-18006	1.3



- d) Take out the counter gear cluster from transmission case after this decision.

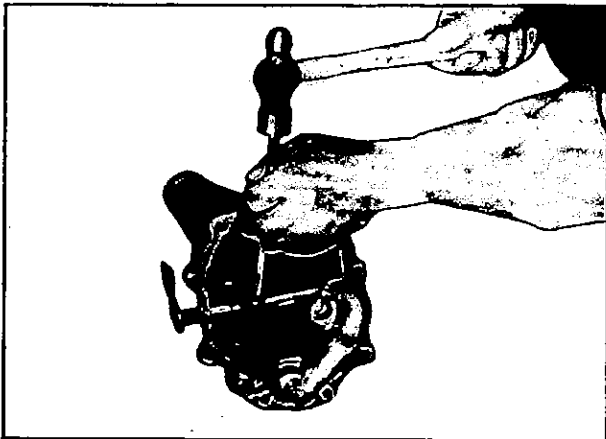
Assembling the Rear Extension

- a) Insert the "E" ring, thrust washer and "O" ring to the second, third cross rod shaft.

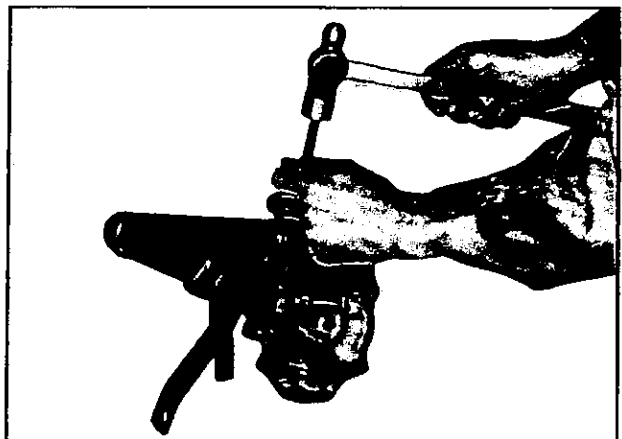


DATSUN 1000

b) Assemble the second, third speed operating lever to the cross shaft and lock with pin.

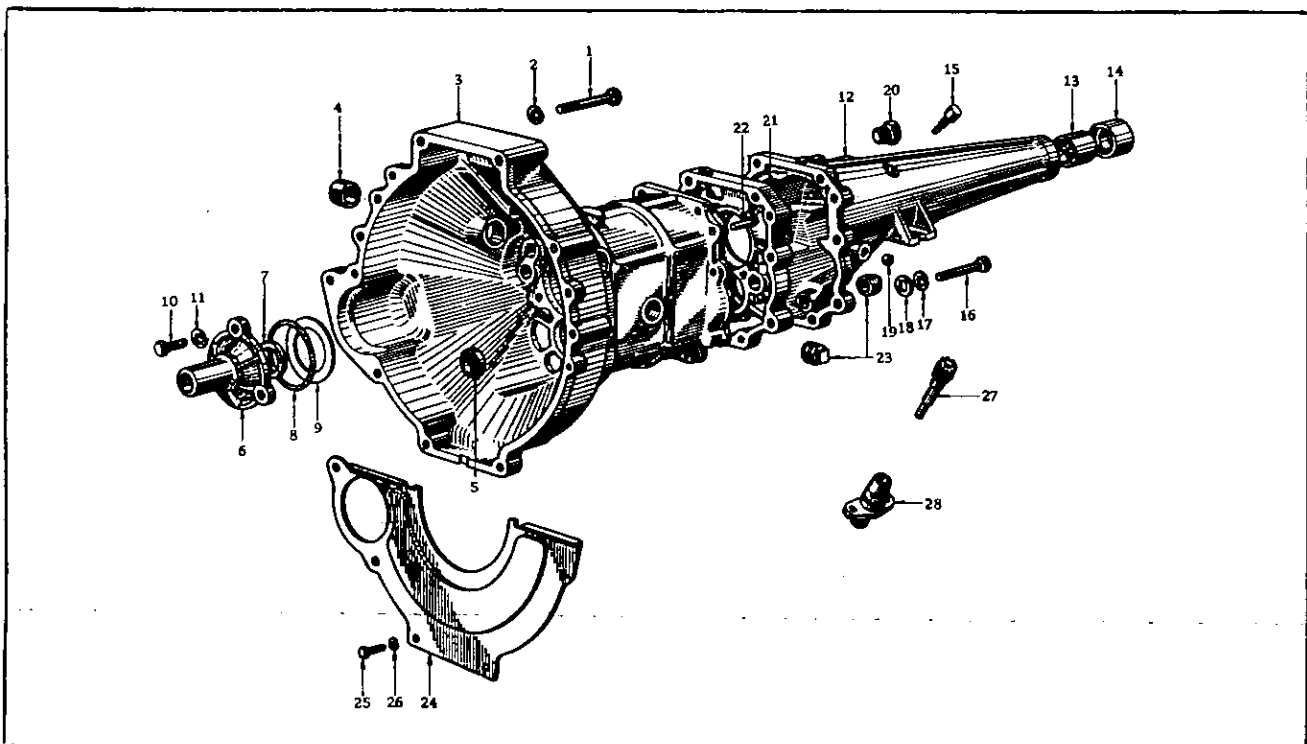


d) Assemble the first, reverse speed operating lever to this shaft.



c) Put the "O" ring for the first, reverse speed cross shaft.

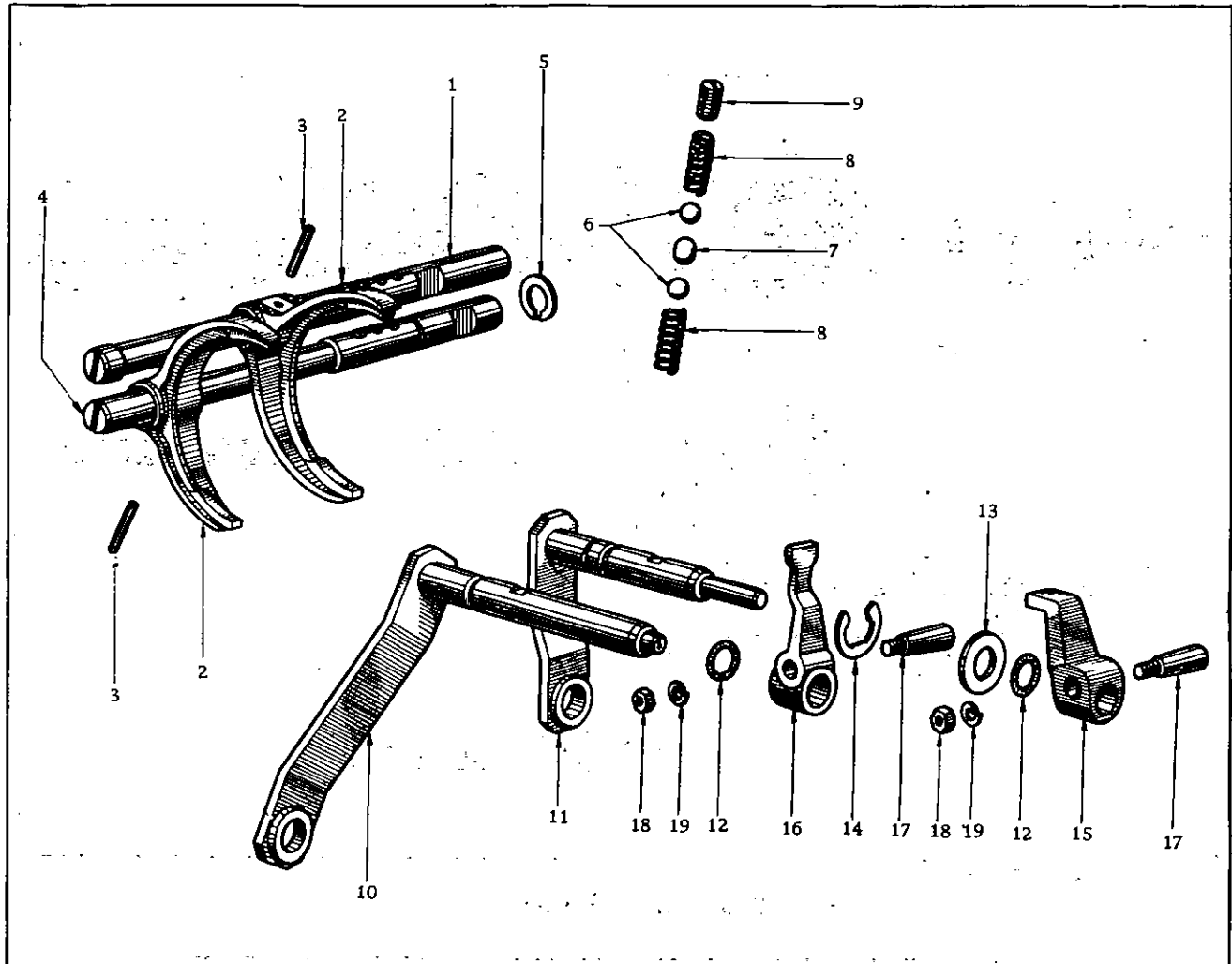
e) Knock and set the oil, seal for end of rear extension.



Transmission Case & Rear Extension

1 Bolt	11 Washer-lock	21 Ass'y-plate, adapter
2 Washer-lock	12 Ass'y-extension, rear	22 Pin-dowel, rear extension
3 Comp. -case, transmission	13 Bush-rear extension	23 Plug
4 Bushing-clutch shaft	14 Seal-oil, rear extension	24 Cover-dust, clutch housing
5 Plug-welch	15 Ass'y-breather	25 Bolt
6 Ass'y-cover, transmission case	16 Bolt	26 Washer-lock
7 Seal-oil, front cover	17 Washer-lock	27 Ass'y-pinion, speedometer
8 Seal-oil, front cover	18 Washer-plain	28 Ass'y-sleeve, speedometer
9 Shim-adjusting, front cover	19 Plug-welch, rear extension	29 "O" ring-speedometer pinion
10 Bolt	20 Plug-reverse lamp switch	

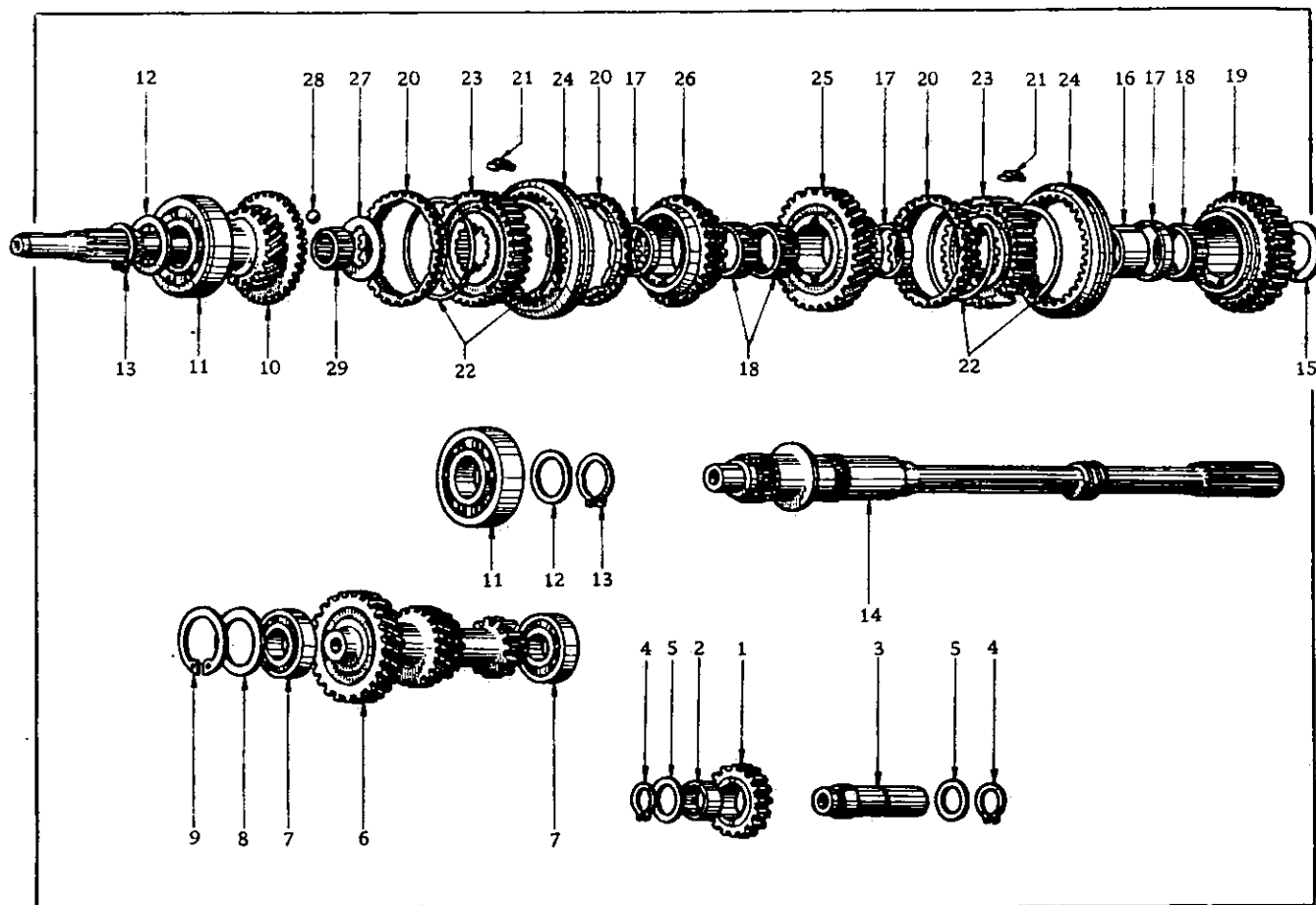
TRANSMISSION



Transmission Gear Shifting

1	Rod-fork, reverse & 1st	11	Comp. -shaft, cross, 2nd & 3rd
2	Fork-shift	12	Ring-"O", cross shaft
3	Pin-retaining, fork	13	Washer-thrust, cross shaft
4	Rod-fork, 2nd & 3rd	14	Ring-"E", cross shaft
5	Ring-stopper	15	Lever-operating, 2nd & 3rd speed
6	Ball-checking	16	Lever-operating, 1st & reverse speed
7	Plunger-inter lock	17	Pin-retaining
8	Spring-checking ball	18	Nut
9	Plug-checking	19	Washer-lock
10	Comp. -shaft, cross, 1st & reverse		

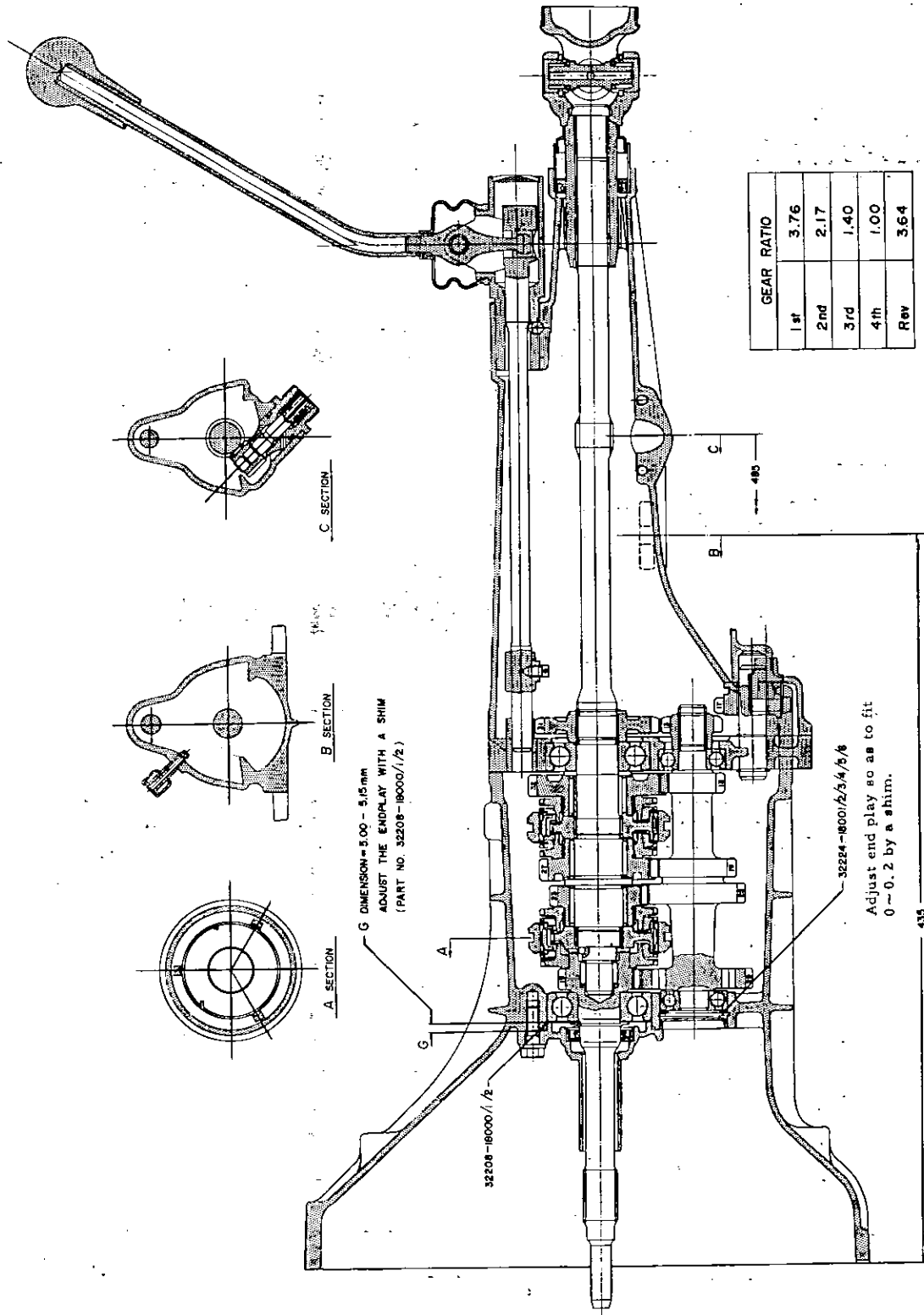
DATSUN 1000



Transmission Gears

1	Ass'y-gear, reverse idler	16	Bushing-main shaft, reverse gear
2	Bushing-gear, reverse idler	17	Spacer-needle bearing
3	Shaft-reverse idler	18	Bearing-needle, main shaft
4	Ring-snap, reverse idler	19	Ass'y-gear, reverse, main shaft
5	Washer-thrust, reverse idler	20	Ring-baulk
6	Ass'y-gear, counter	21	Insert-shifting
7	Bearing-ball, counter shaft	22	Spring-synchronizer
8	Washer-adjusting, counter bearing	23	Hub-synchronizer
9	Ring-snap, counter bearing	24	Sleeve-coupling
10	Ass'y-gear, main drive	25	Ass'y-gear, 1st speed
11	Bearing-ball, main shaft	26	Ass'y-gear, 2nd speed
12	Washer-main bearing	27	Washer-thrust, synchronizer hub
13	Ring-snap, main drive gear & main shaft	28	Ball-steel
14	Shaft-main	29	Bearing-pivot, main shaft
15	Washer-thrust, main shaft		

TRANSMISSION



Standard for L. H. D
Optional use for R. H. D

DATSUN 1000





SERVICE MANUAL

CHASSIS

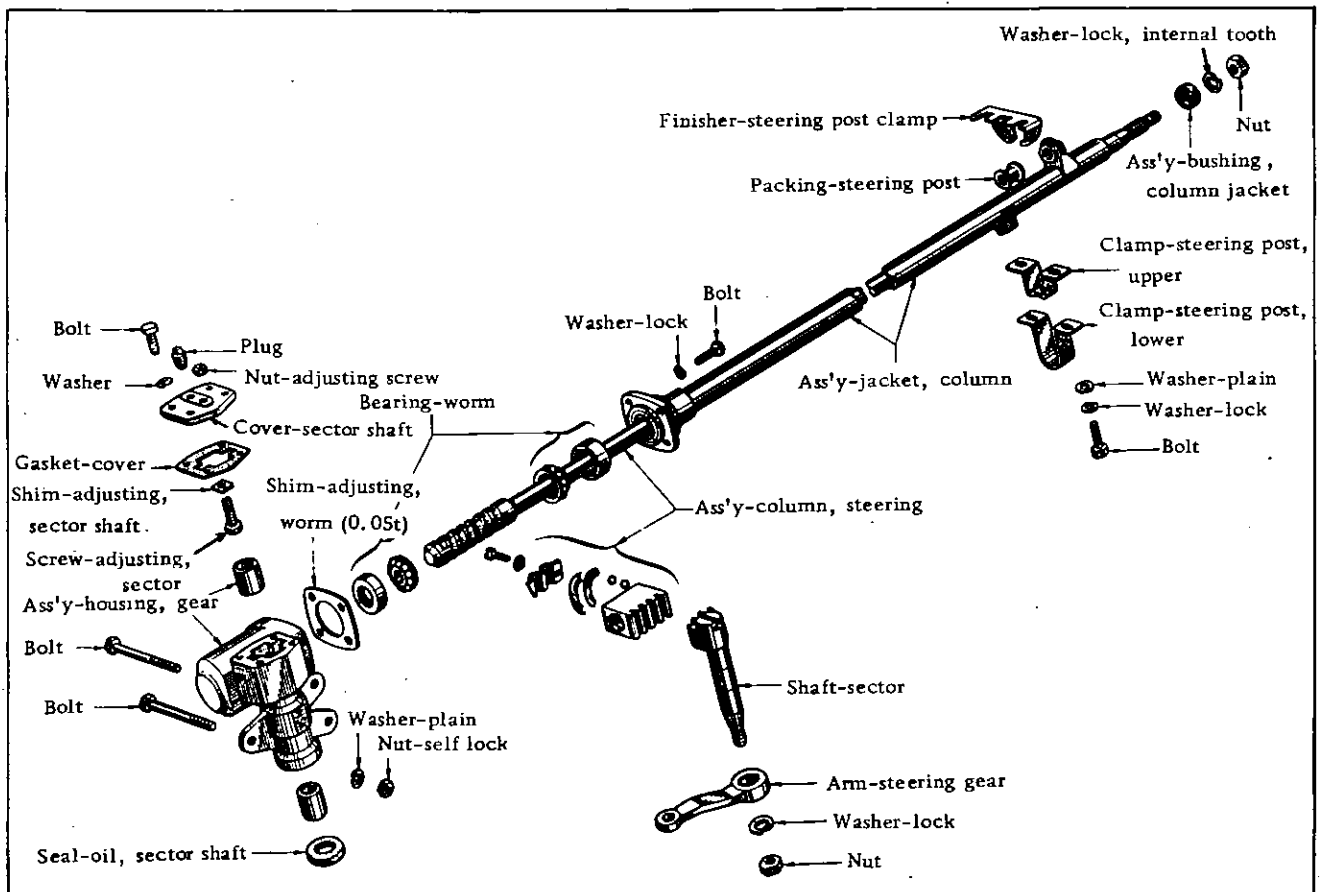
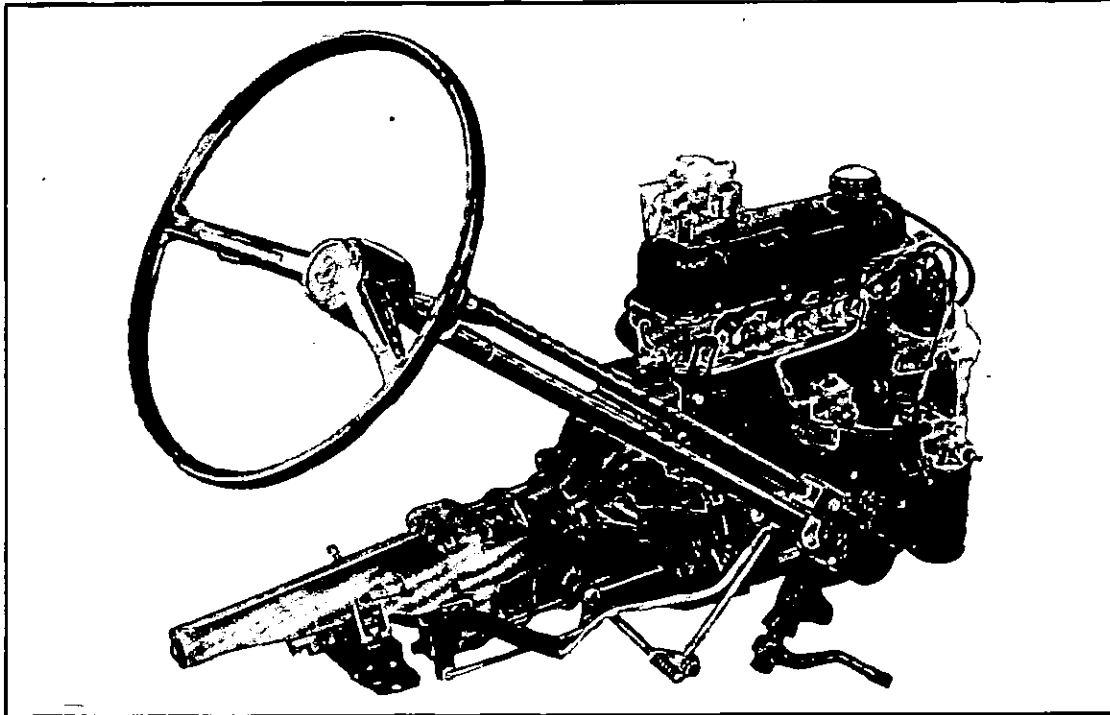
MODEL B10 SERIES



NISSAN MOTOR CO., LTD.

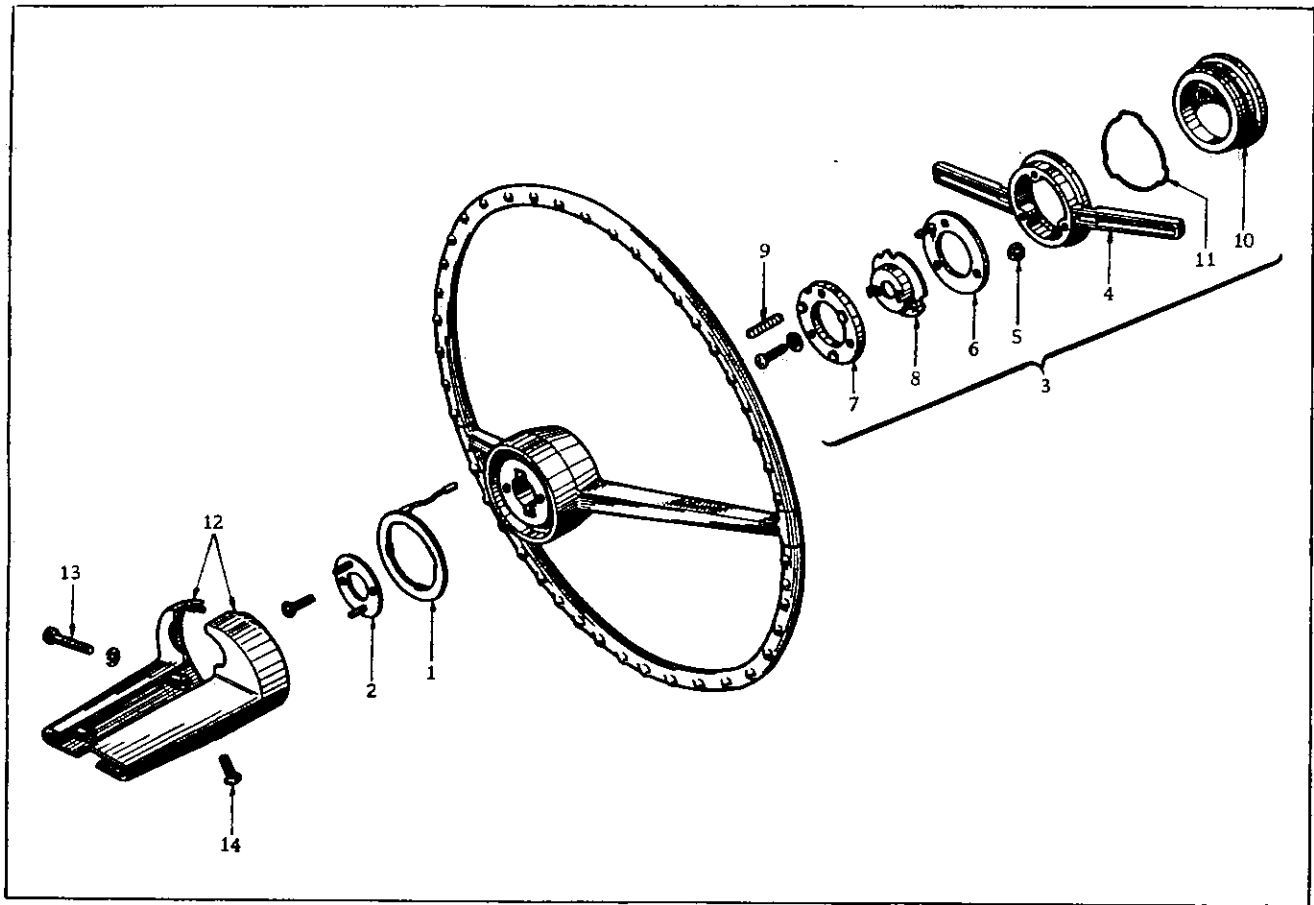
CHASSIS

STEERING



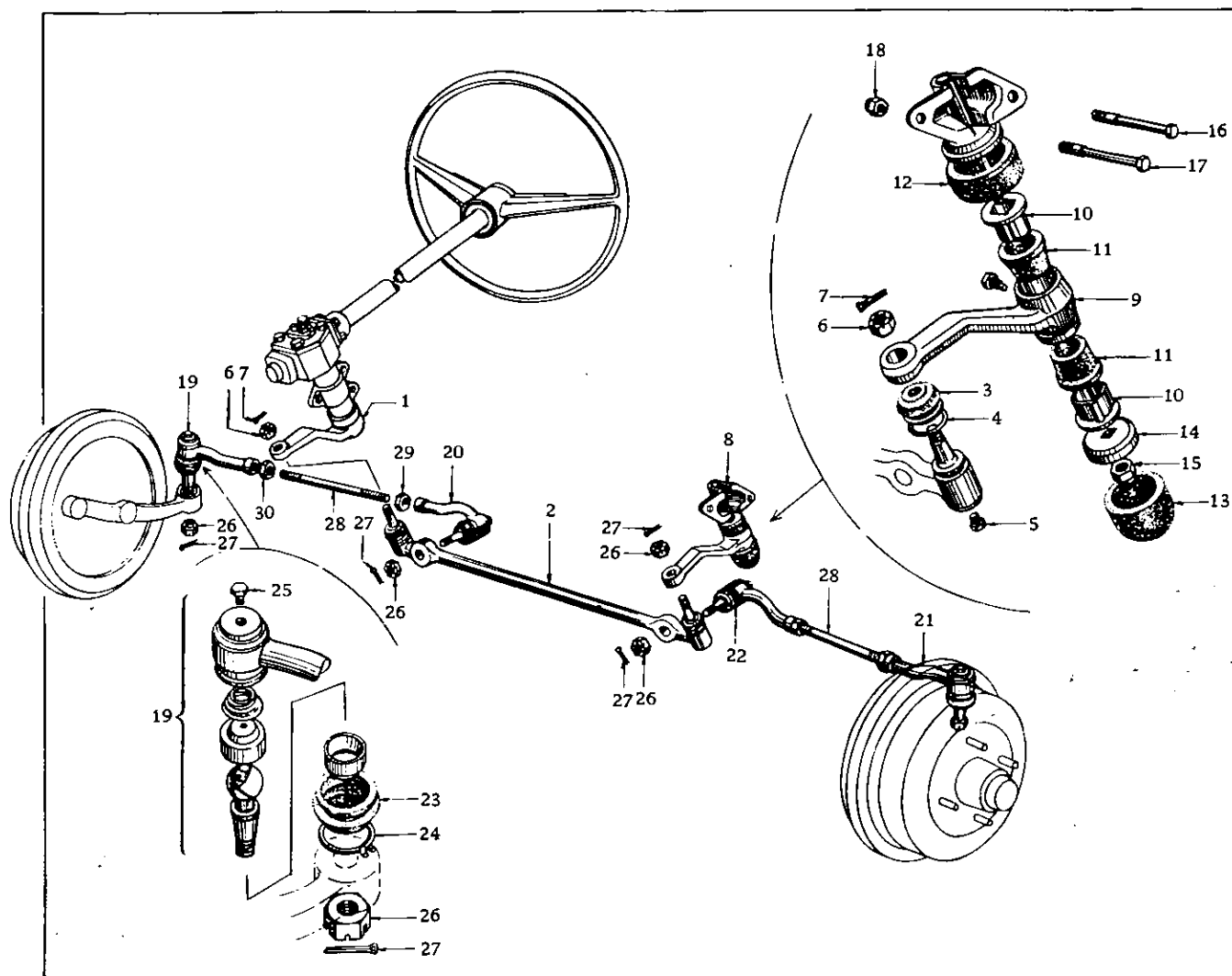
Components of Steering Gear Box

DATSUN 1000



Steering Wheel

1	Ass'y-ring, slip	8	Seat-horn
2	Insert	9	Spring-horn
3	Ass'y-bar, horn	10	Button-horn
4	Bar-horn	11	Lock-horn button
5	Insulator-horn bar	12	Ass'y-shell, steering column
6	Ass'y-plate, contact	13	Screw
7	Ring-insulator	14	Screw



Steering Linkage

1 Arm-steering gear	11 Bushing-rubber, idler shaft	21 Ass'y-socket, side rod outer (L.H.)
2 Ass'y-rod, cross	12 Cover-dust, idler shaft	22 Ass'y-socket, side rod inner (L.H.)
3 Cover-dust, side rod	13 Cover-dust, idler shaft, lower	23 Cover-dust, side rod
4 Clamp-dust cover	14 Washer-idler shaft, lower	24 Clamp-dust cover
5 Plug-filler	15 Nut-self lock	25 Plug-filler
6 Nut	16 Bolt	26 Nut
7 Pin-cotter	17 Bolt	27 Pin-cotter
8 Ass'y-idler	18 Nut	28 Bar-side rod
9 Arm-idler	19 Ass'y-socket, side rod inner (R.H.)	29 Nut-lock, side rod (L.H.)
10 Bushing-idler, shaft	20 Ass'y-socket, side rod inner (R.H.)	30 Nut

DATSUN 1000

Steering type	Recirculating ball type	
Gear ratio		15 : 1
Rotational numbers		3.4
Max. steering angle	In	45°
	Out	36° 36'
Gear oil capacity	0.24	(MP #90)

The steering mechanism consist of the re-circulating ball type robust structure and gives light handling and stable functioning. The worm gear supported with upper and lower angular contact ball bearings to the housing is meshed with the sector arm through the circulating steel balls (60 numbers). This assembly is enclosed in an oil tight casing which carries two ball bearings at either end of the cam.

When the steering wheel is turned the tube revolves the cam, which in turn, causes the taper peg to remove over a predetermined arc thus giving the rocker shaft its desired motion, connected to the rocker shaft is a steering side cross rod lever, that links up with the steering linkage.

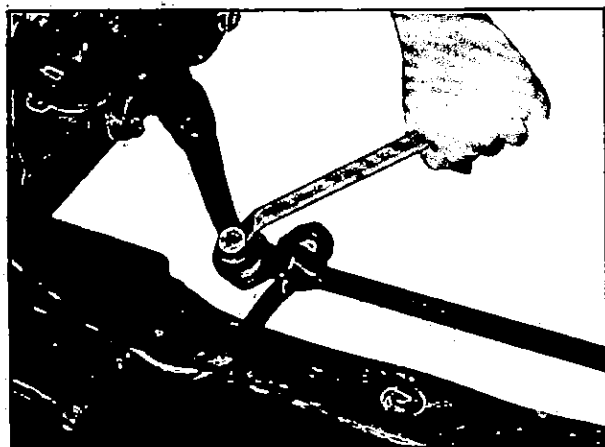
The steering linkage is the parallelogram system and connected to the rear side of the front axle.

Two shorter side rod, one on either side, connect the steering gear arm to the steering gear and idler arms respectively.

Side Rods

The side rods are held in position by a castilated nut and split pin at each end.

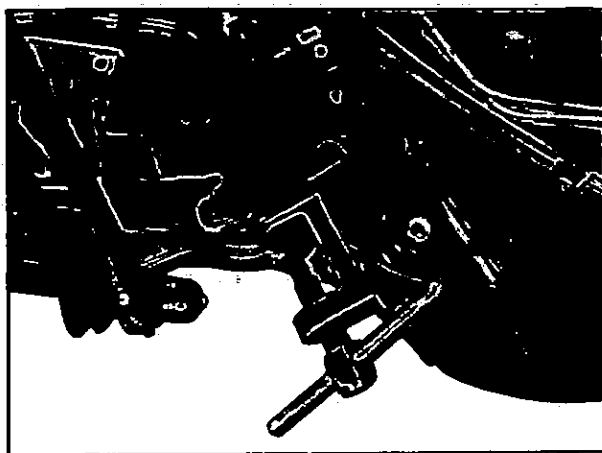
To remove the rod, withdraw the split pin



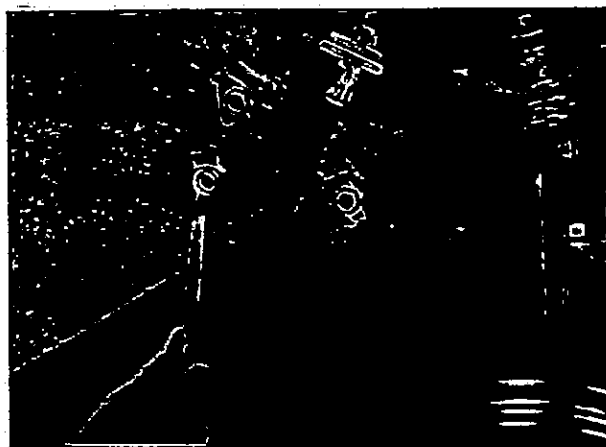
and release the nut at each end of the rod and then slightly tap the rods clear of the levers to which they are connected.

The steering gear arms and idler respectively by a nut and split pin each. Normally these levers need not be removed for any general maintenance.

The only occasion requiring the removal would be when damage has occurred, under which circumstances the steering box or under idler should also be remove for inspection when the arm concerned can be withdrawn one the steering gear box or idler has been removed to the service bench, the gear arm should be with drawn front the shaft converned using a suitable extractor.



The gear arm must not be hammered from its shaft.



After the side and cross rods disconnected the idler can be detached from the body.

It is secured by two bolts to the front suspension member.

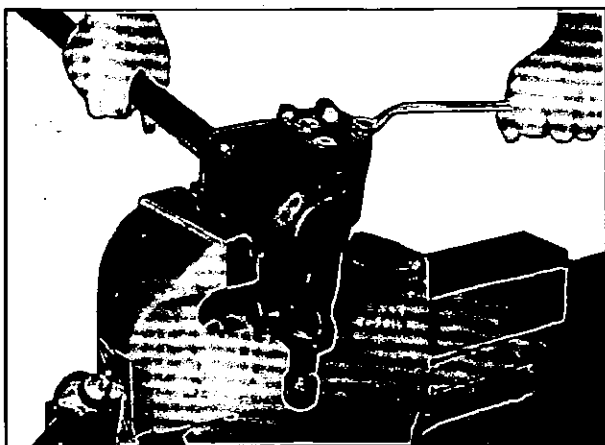
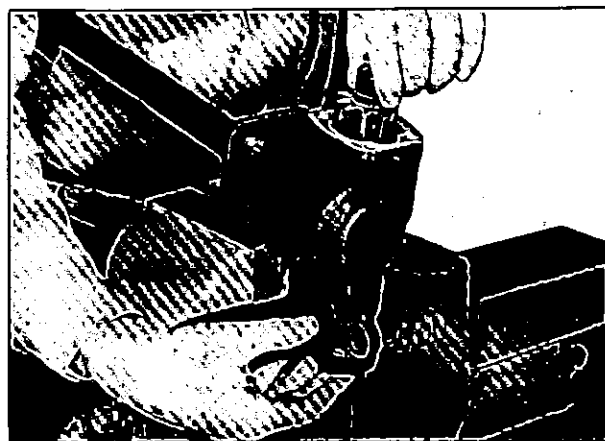
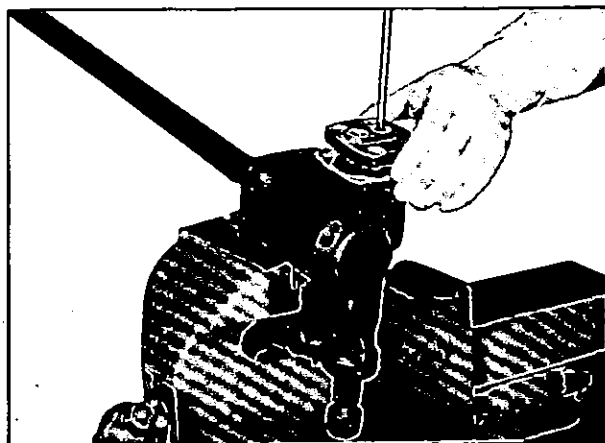
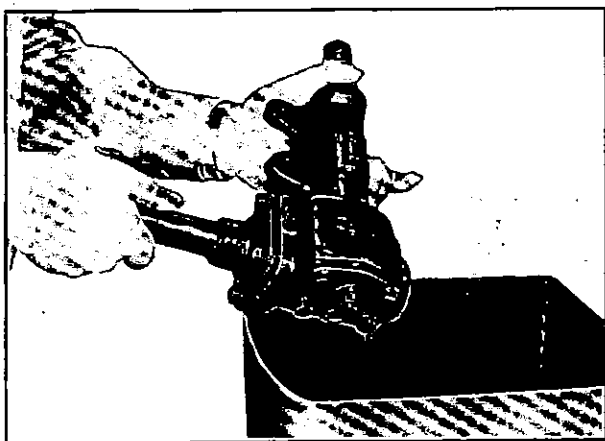
Holding the idler body on the bench, take off the rubber cover.

Pull out the idler shaft out of the body.

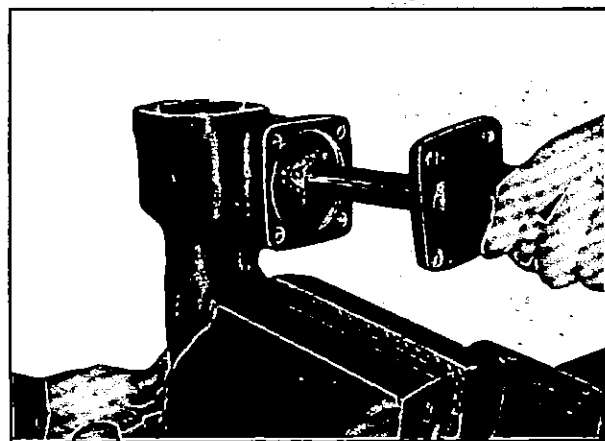
STEERING GEAR HOUSING

Removal

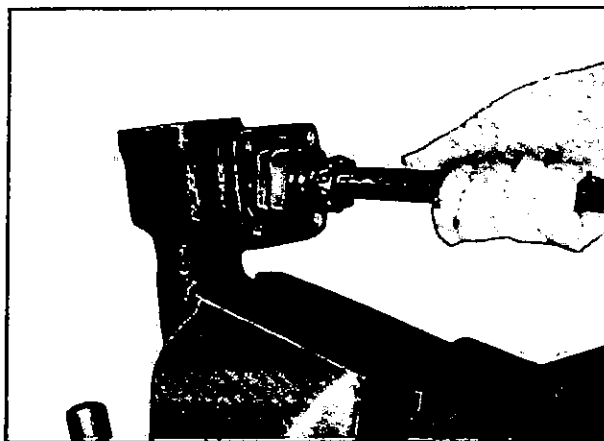
Take off the plug and drain out gear oil.



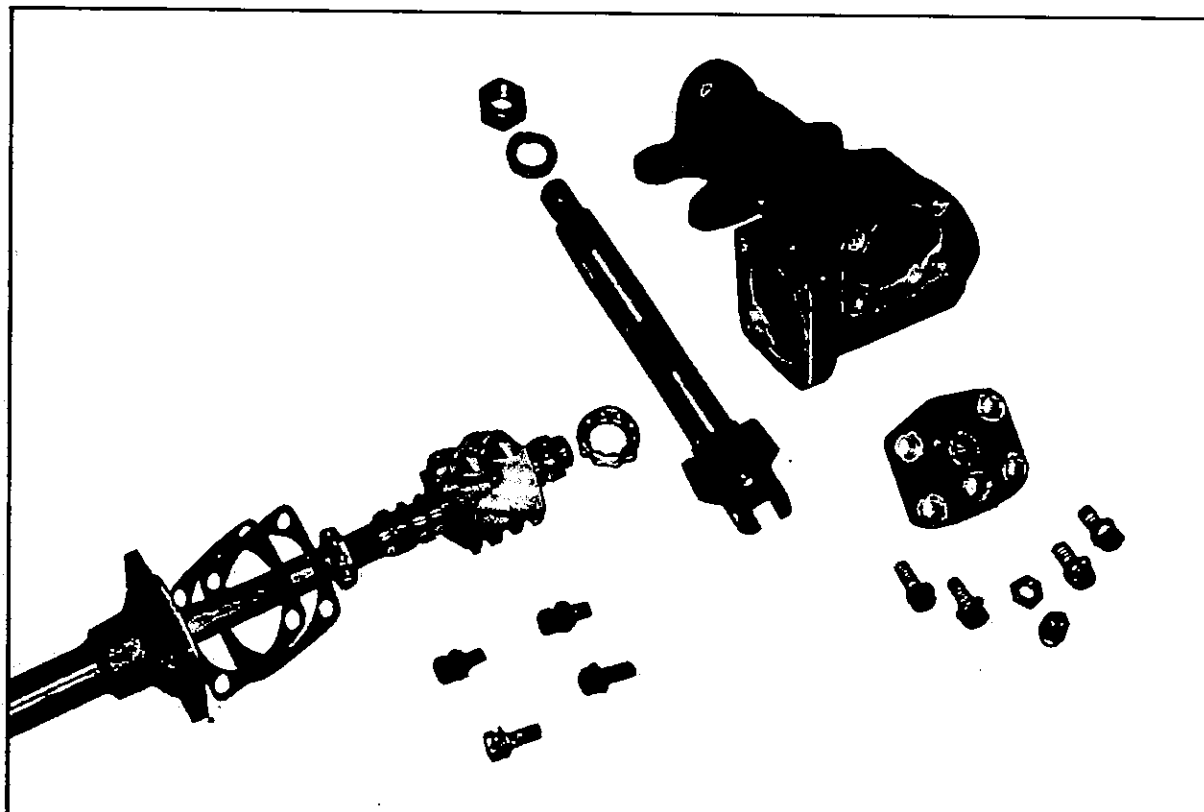
Separate the adjusting screw and the side cover and detach the sector shaft from body.
Unscrew the fixing bolts of rear cover.



Unscrew the lock nut of adjusting screw, and then take off the side cover.



Draw out the ball nut assembly.



Components of Steering Gear Housing

Assembling of steering gear housing is a reversal order of disassembly.

Assembling

Slip the nut over the worm with the ball guide holes up and the shallow end of the rack teeth. Align the grooves in the worm and nut by

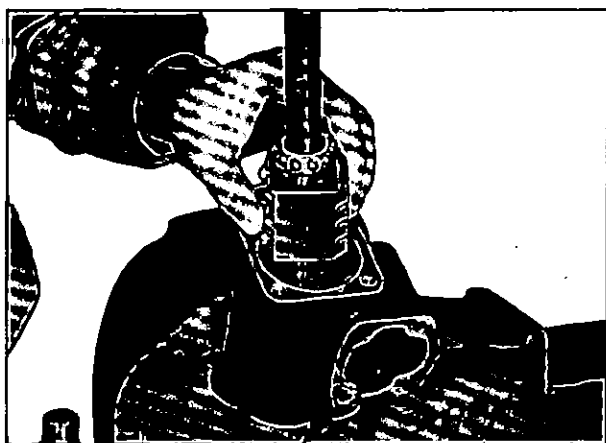
sighting through the ball guide holes count 60 balls into a suitable container. This is the proper number of balls for this ball nut.

Drop balls into each of two holes on the same side of nut. This operation may be performed from either side of nut, but two holes on the same side must be used, not two holes on same end.

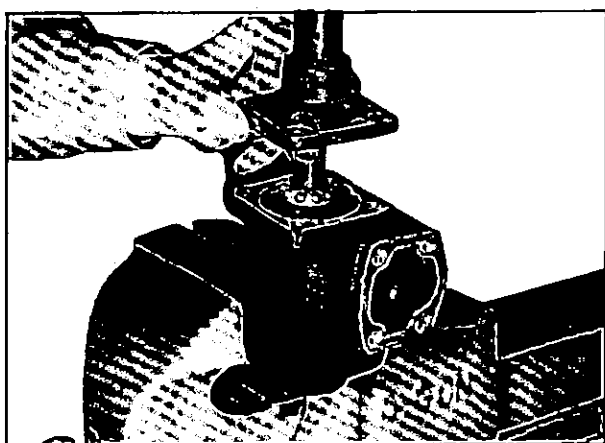
Shake the nut gradually away from hole being filled. Continue until the balls are installed in full. Place remaining balls in ball guides, in each of two halves.

Push the guide into holes of the nut. If the guides do not push all the way down easily, tap lightly into place. Assemble the ball guide clamp to the nut, being sure to use a lock washer under the clamp screw then tighten the screw securely.

Check the assembly by rotating the nut on the worm to see that it moves freely.



Insert the ball nut assembly with the worm bearing at rear side into the gear housing and smear the oil to the worm bearing.



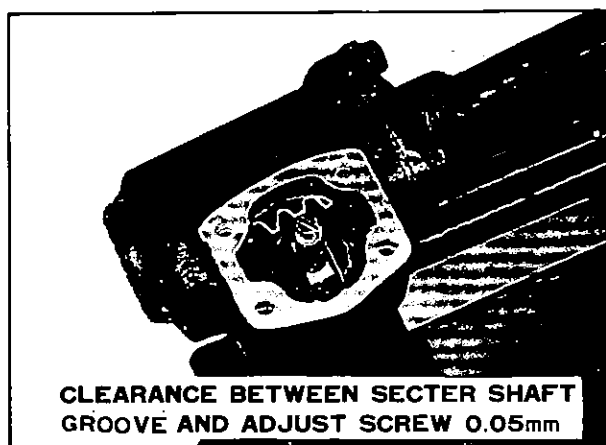
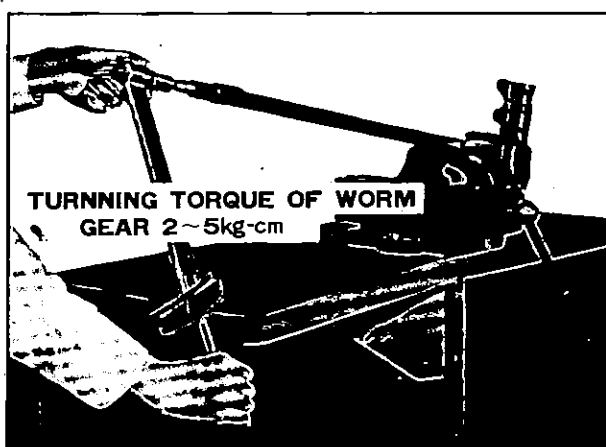
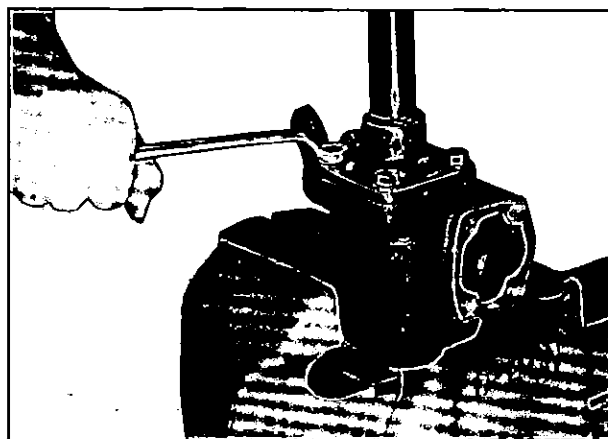
Select the same thickness of shims at the disassembling time and connect the column assembly with it to the gear housing.

Tight the rear cover bolts.

Tightening torque

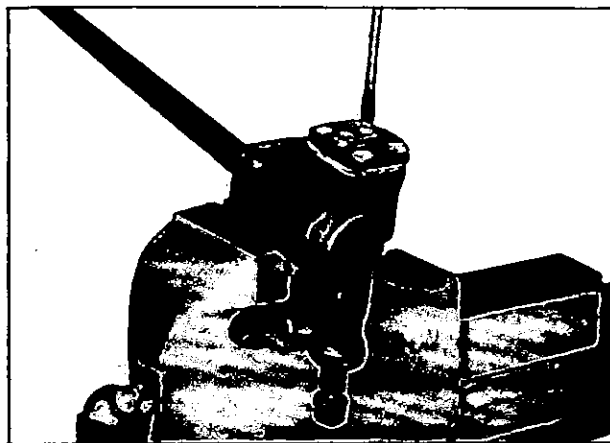
Front rear cover

1.8 ~ 2.5 kg-m



Fitting the side cover with adjust screw, fix the side cover to gear box by turning it for left way.

DATSUN 1000

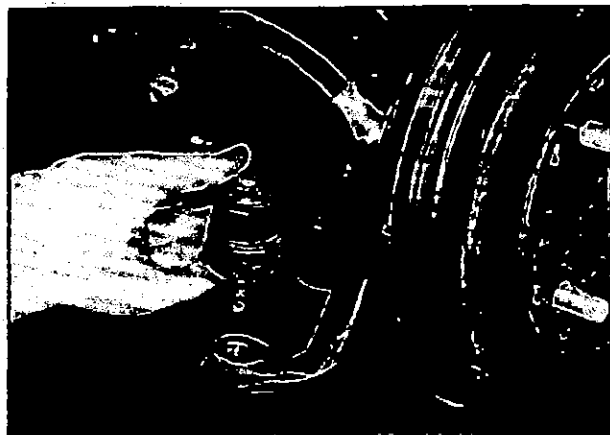


Tightening torque

Side cover 1.8 ~ 2.5 kg-m

Set up the gear arm temporarily to the shaft.

Adjust the play at the gear arm top within 0.1 mm and then lock temporarily by the nut.



Rotating the gear arm several times for right and left way to find and correct center without any variation about back-lash.

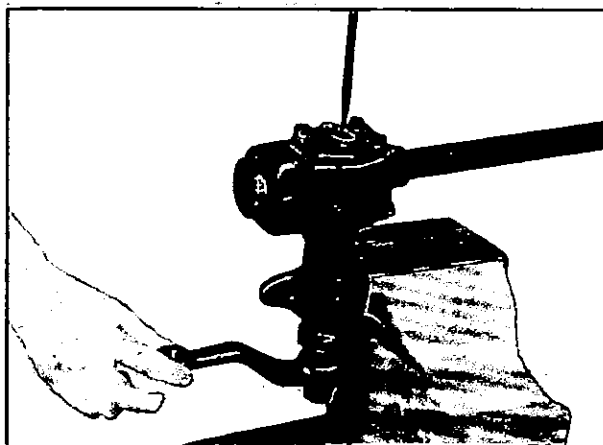
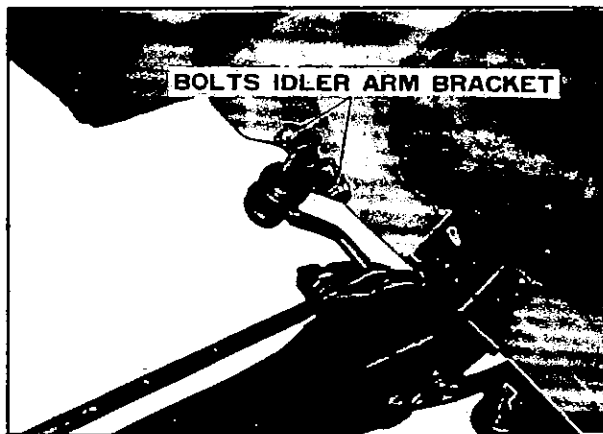


After then lock by nut surely and tighten the oil plug.

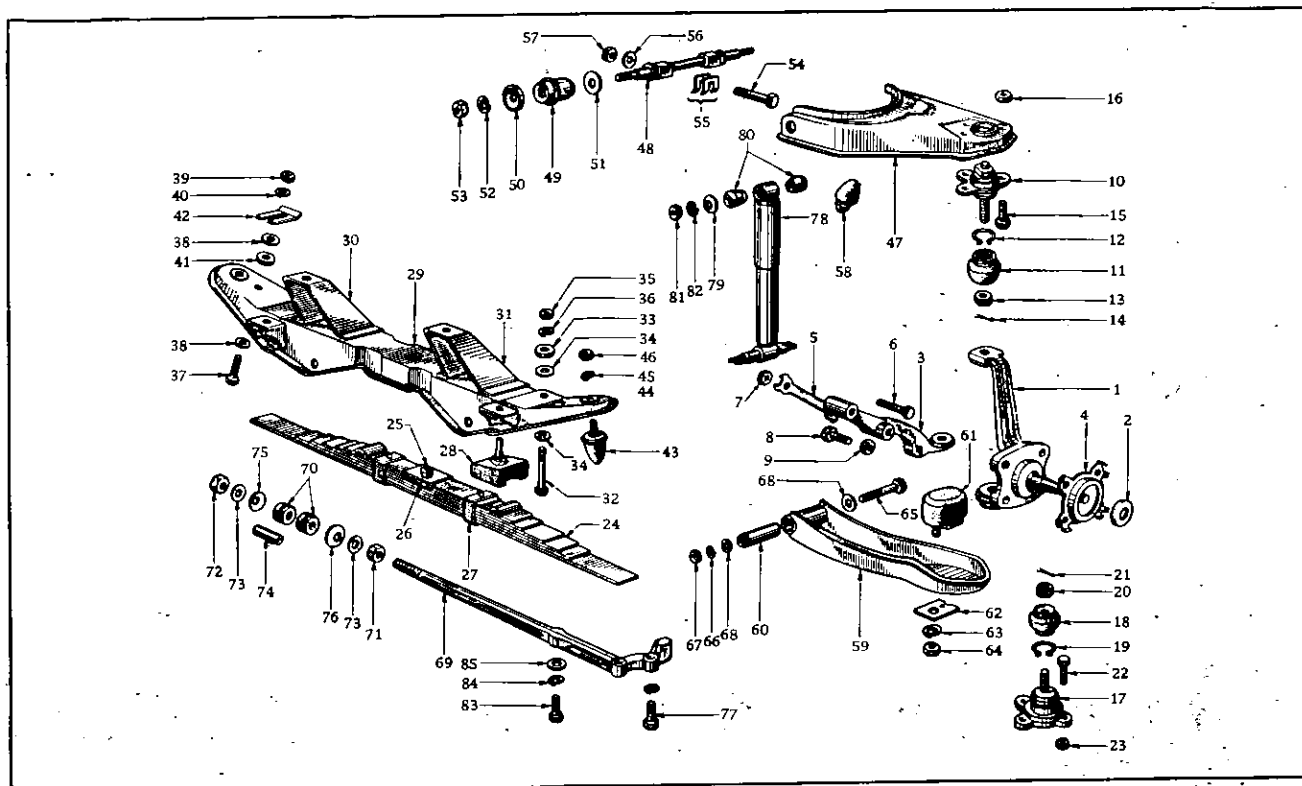
Tightening torque

kg-m

Connecting bolt, gear box	6
Ball stud	3.5 ~ 4.9
Nut, steering wheel	4 ~ 4.5
Nut, idler arm bracket	1.9 ~ 2.6
Tie-rod end	3.5 ~ 4.9



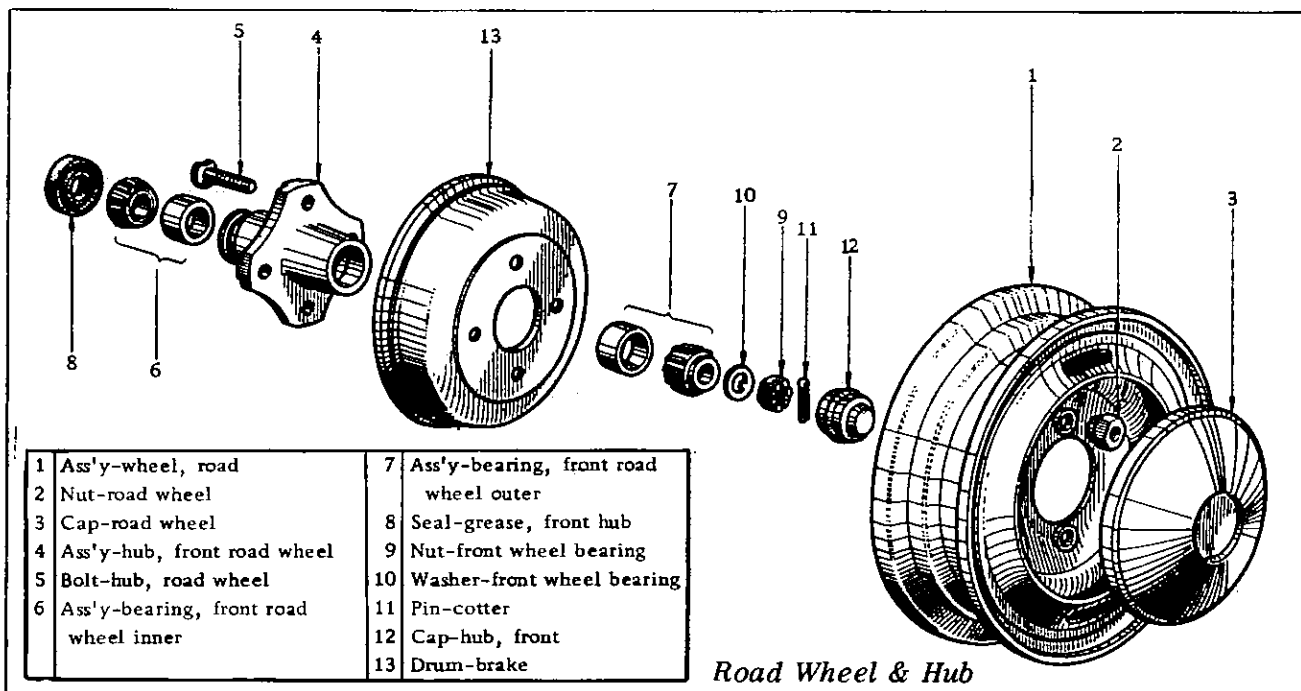
FRONT AXLE



Front Axle & Suspension

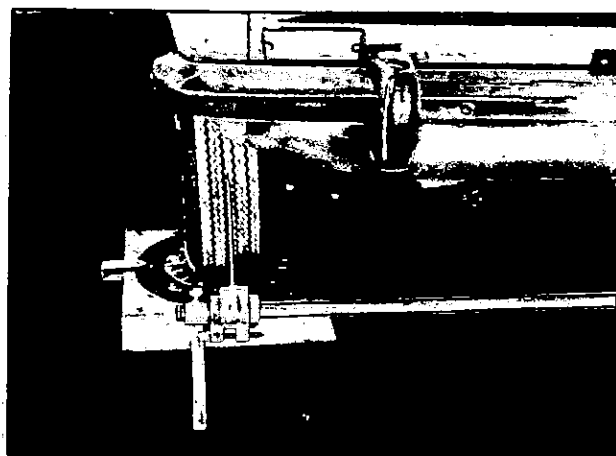
1	Ass'y-spindle, knuckle	28	Seat-pivot, front, spring	57	Nut
2	Collar-front spindle	29	Ass'y-member, front suspension member	58	Bumper-rebound
3	Arm-knuckle	30	Bracket-engine mounting front (R.H)	59	Ass'y-link, lower, front suspension
4	Catcher-grease front	31	Bracket-engine mounting front (L.H)	60	Bushing-rubber, lower link
5	Plate-lock, knuckle arm	32	Bolt-mounting suspension member	61	Support-rubber, front spring
6	Bolt	33	Washer-mounting bolt	62	Spacer-support, front spring
7	Nut	34	Shim-mounting	63	Washer-lock
8	Bolt-steering stopper	35	Washer-lock	64	Nut
9	Nut	36	Nut	65	Pin-lower link
10	Ass'y-joint, ball upper, front suspension	37	Bolt	66	Washer-lock
11	Cover-dust upper	38	Washer-plain	67	Nut
12	Clamp-dust cover	39	Nut	68	Washer-plain
13	Nut	40	Washer-lock	69	Rod-tension
14	Pin-cotter	41	Washer	70	Bushing-tension rod
15	Bolt	42	Shim-mounting	71	Nut-self lock
16	Nut	43	Bumper-bound	72	Nut
17	Ass'y-joint, lower ball, front suspension	44	Washer	73	Washer-plain
18	Cover-dust, lower ball joint, inner	45	Washer-lock	74	Collar-tension rod
19	Clamp-dust cover	46	Nut	75	Washer-special, tension rod
20	Nut	47	Comp.-link, upper, front suspension	76	Washer-special, tension rod
21	Pin-cotter	48	Spindle-upper link	77	Bolt
22	Bolt	49	Bushing-rubber, upper link	78	Shock-absorber, front
23	Nut	50	Washer-upper link outer	79	Washer
24	Ass'y-spring, front suspension	51	Washer-upper link inner	80	Bushing-rubber
25	Bolt-center	52	Washer-lock	81	Nut
26	Seat	53	Nut	82	Washer-lock
27	Clip	54	Bolt-spindle, upper link	83	Bolt
		55	Shim-camber	84	Washer-lock
		56	Washer-tooth lock	85	Washer-plain

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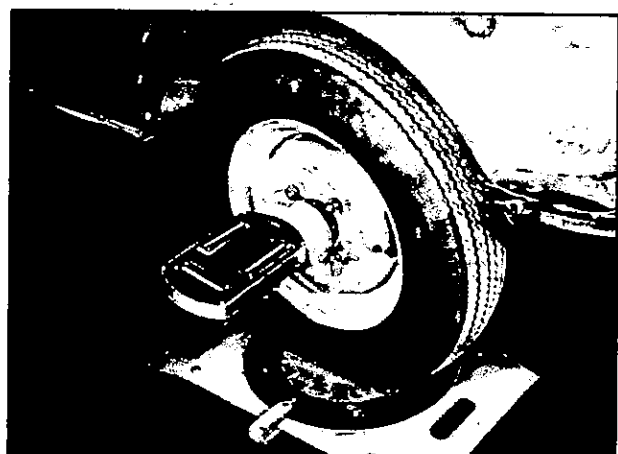


Front Wheel Alignment Data

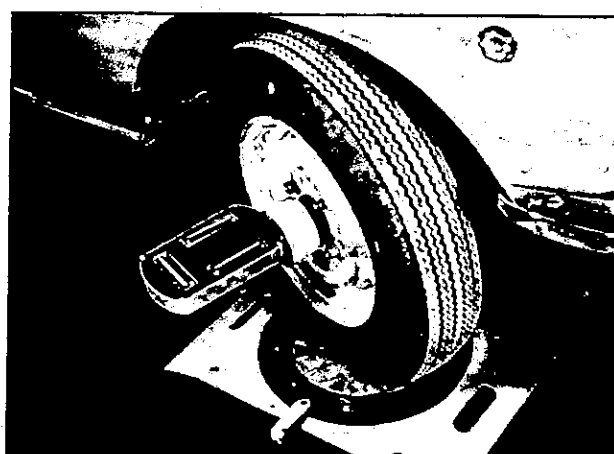
Toe-in	2 ~ 3 mm
Camber	1°45'
Caster	2°15'
King pin angle	6°30'
Side slip	Less than 3 mm with each running distance 1 mm
Turning angle (Inside)	45°
(Outside)	36°36'
Rotation torque front hub (Motive)	Less than 9 kg-cm
Clearance of front hub to direction along the shaft	Less than 0.08 mm
Clearance of ball joint to direction along the shaft	Less than 0.9 mm



Toe-in



Camber



Caster

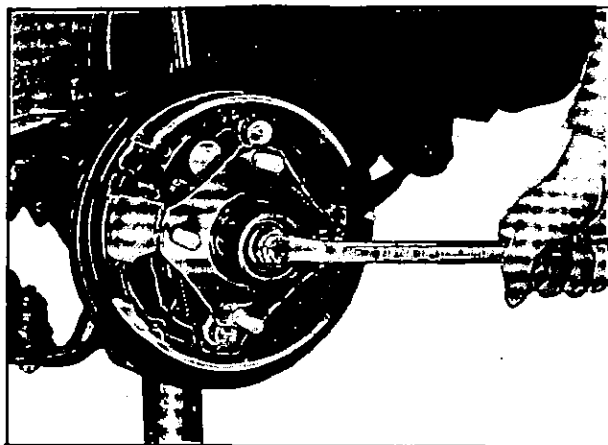
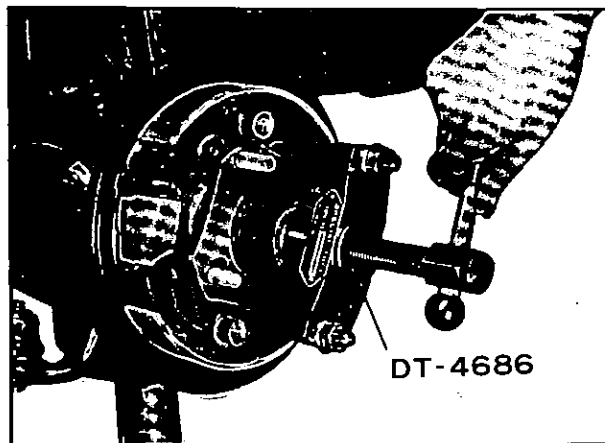
DISMANTLING THE FRONT HUB

To dismantle the front hub, first jack up the car until the wheel is clear of the ground and then place a stand under the side member.

Jack down the car on the stand.

Remove the wheel. If the drum appears to hold on the brake shoes, the shoe adjusters should be slackened. Take off the hub cap by a lever, and then extract the split pin from the spindle nut.

Using a box spanner, remove the spindle nut and the flat washer under it, extract the road wheel hub with the bearing from the knuckle spindle by the puller as shown the figure.

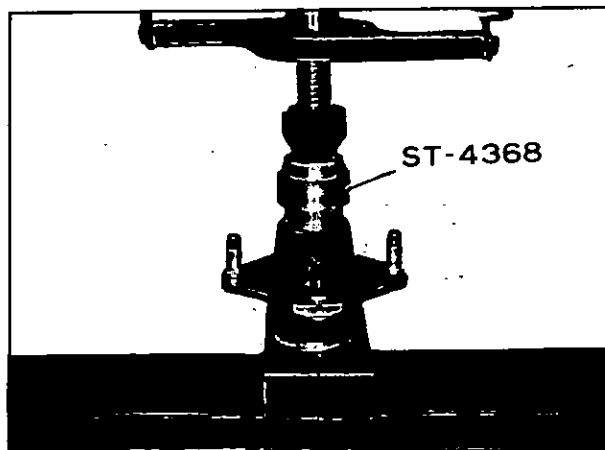
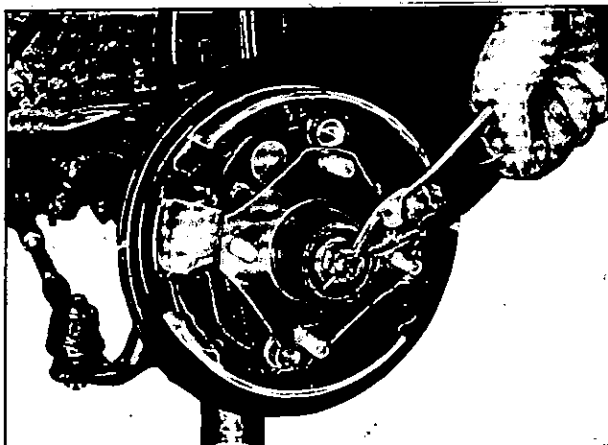


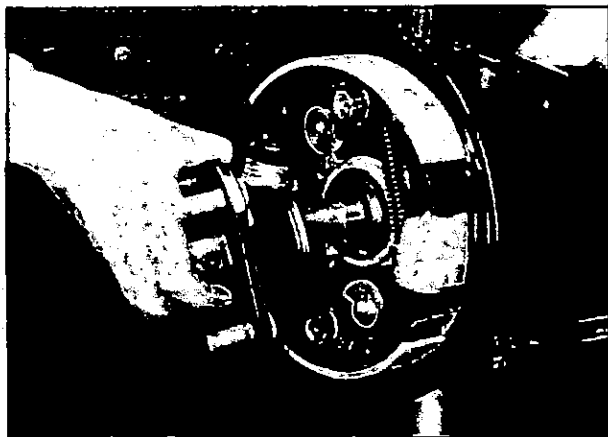
After the hub removed, the bearings can be dismantled. The inner bearing and oil seal can then be removed by inserting the drift from the opposite side of the hub.

Assembling the Wheel Hub

When assembling the inner bearing cone to the hub smear sufficiently the grease to the inner face of wheel hub.

Assemble the wheel bearing to the wheel hub as shown the figure.





Pack the hub with recommended grease. Replace the hub oil seal over the inner bearing. Renew the seal if it is damaged.

Adjusting for Pre-load of Wheel Bearings

Tightening torque of spindle nut

1.6 ~ 1.8 kg-m (in the case of lubricated on the face of screw and washer somewhat)
2.3 ~ 2.5 kg-m (without any lubrication)

Rotating the wheel hub several times for setting smoothly, and then again tight the nut with the aforesaid torque.

Torque for rotation of beginning

25 ~ 30 kg-cm

Fit the pin hole with the spindle nut within 40° ~ 70° degree turning back around the nut.

Again rotating the wheel hub, make sure as to beginning torque for rotation and end play for horizontal way along the spindle.

a) Torque of beginning for rotation

Less than 9 kg-cm

b) End play for horizontal way along the spindle

Under 0.08 mm

Lock the spindle nut by the new cotter pin and lock washer after final adjustment for pre-load.

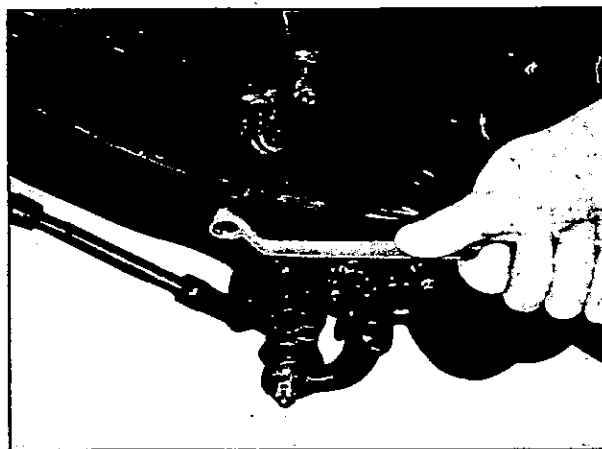
FRONT SPRING

Removal

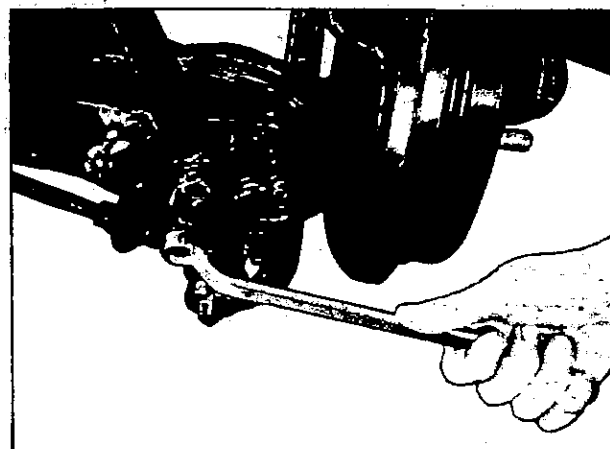
Take out the wheel cap and loose slightly the wheel nut.

Jack up the front suspension member and set on the stands with the side member.

Remove the wheels and attached bolts (2) at the lower side of front shock absorber.

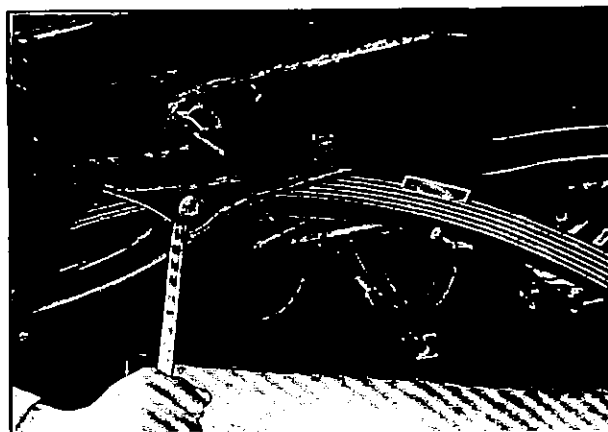
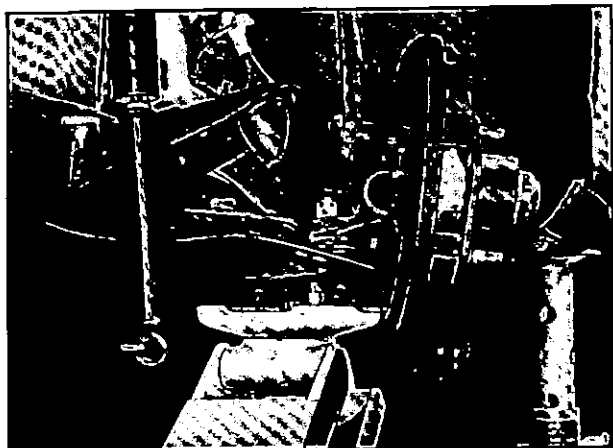


Screw out the bolts (2) at the side of lower link on the tension rod.



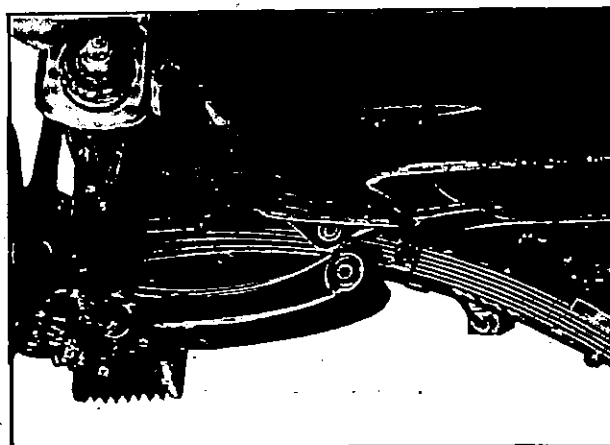
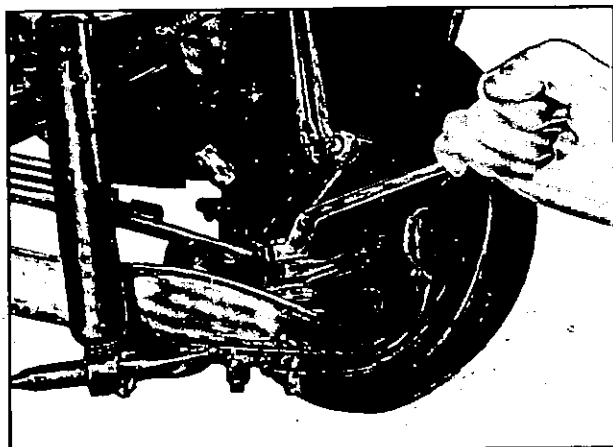
Screw out the attached nut at a front side of tension rod (Leave alone other side nut).

Jack up the end of lower link on the side of removed tension rod.



Remove the nut of lower ball joint after pulling out the cotter pin.

Remove the jack at the end of lower link, then take off the lower link pin.



Supporting the front spring, remove the lower link pin at the unscrewed side of tension rod.

Inspect upon weakness, crack and faults etc.

Free camber

120 mm

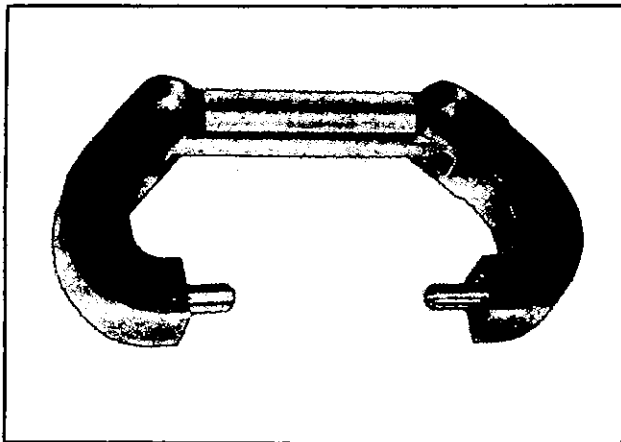
Fixing the Front Spring

Fitting the spring to the lower link at remained side without removing and set it temporarily.

To fix the spring correctly for the pivot seat so as to fit the center pin for the center hole of suspension member.

Jack up the end of spring at the tension rod (removed side) and fix it temporarily by the special tool (ST-4369 Front Spring Clamp).

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Lower the jack and fix the pin of lower link temporarily.

Tightening torque	kg-m
Lower ball joint	5.5 ~ 7.6
Lower link pin	4.2 ~ 5.3
Tension rod (Front side)	4.2 ~ 4.5
(Rear side)	4.2 ~ 5.3

Connect the lower ball joint to swivel axle and then attach the wheels.

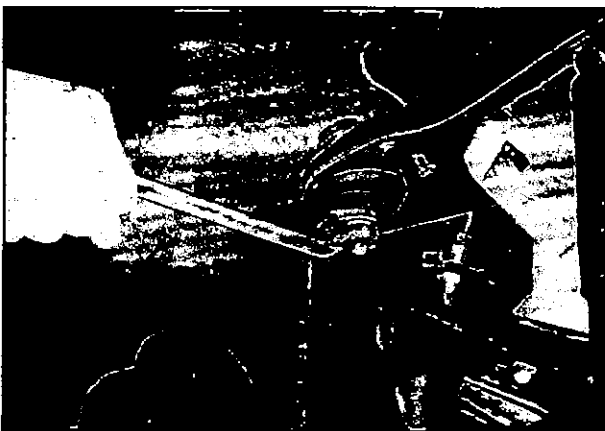
Tightening up the lower link pin and wheel nut correctly.

UPPER LINK

Removal

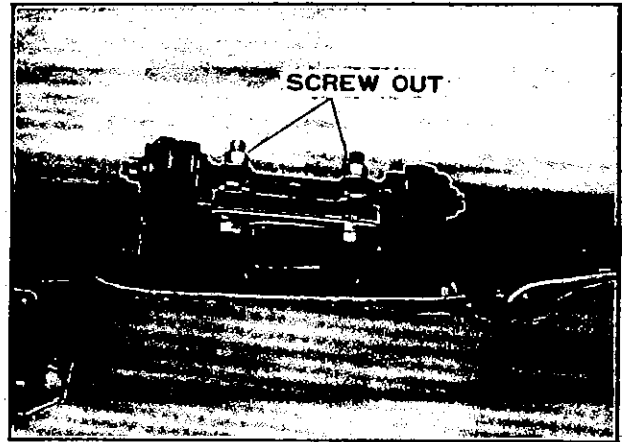
Jack up the front of car and hold on the stand by side cross member.

Remove the fixing nut at the upper of swivel axle.



Remove screen of the hood ledge and then unscrew the bolt of upper link spindle.

Fixing of the upper link is a reversal for removal of it.



Tightening torque	kg-m
Upper ball joint	3.5 ~ 4.9
Fixing nut of upper link spindle	4.2 ~ 5.3

LOWER LINK

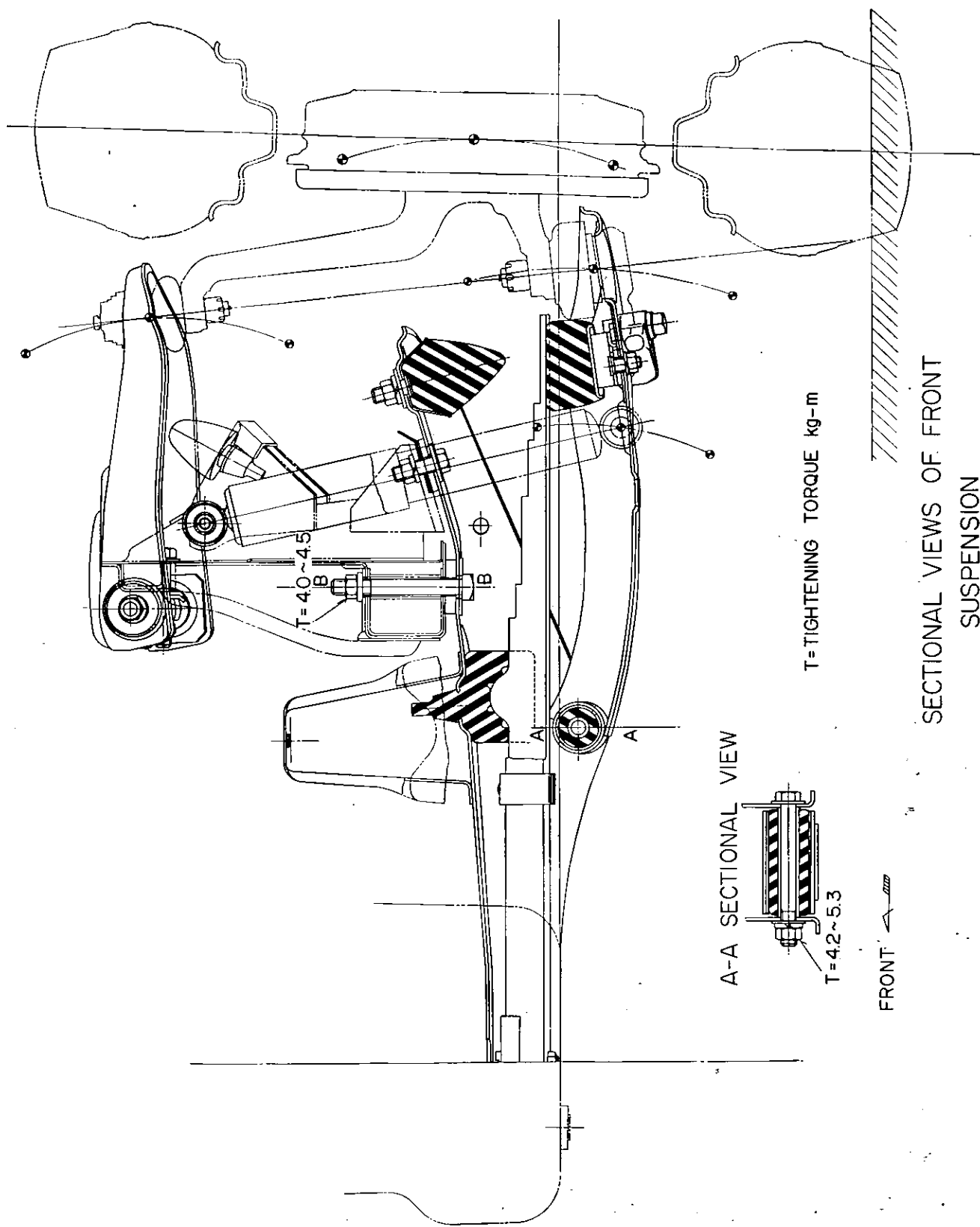
Disassembling

- Jack up the front of car and keep the side cross member on the stands.
- Take out the lower fixing nuts of front shock absorbers.
- Dismount the tension rod.
- Screw out the fixing nut of swivel axle and then pull out the pin of lower link.

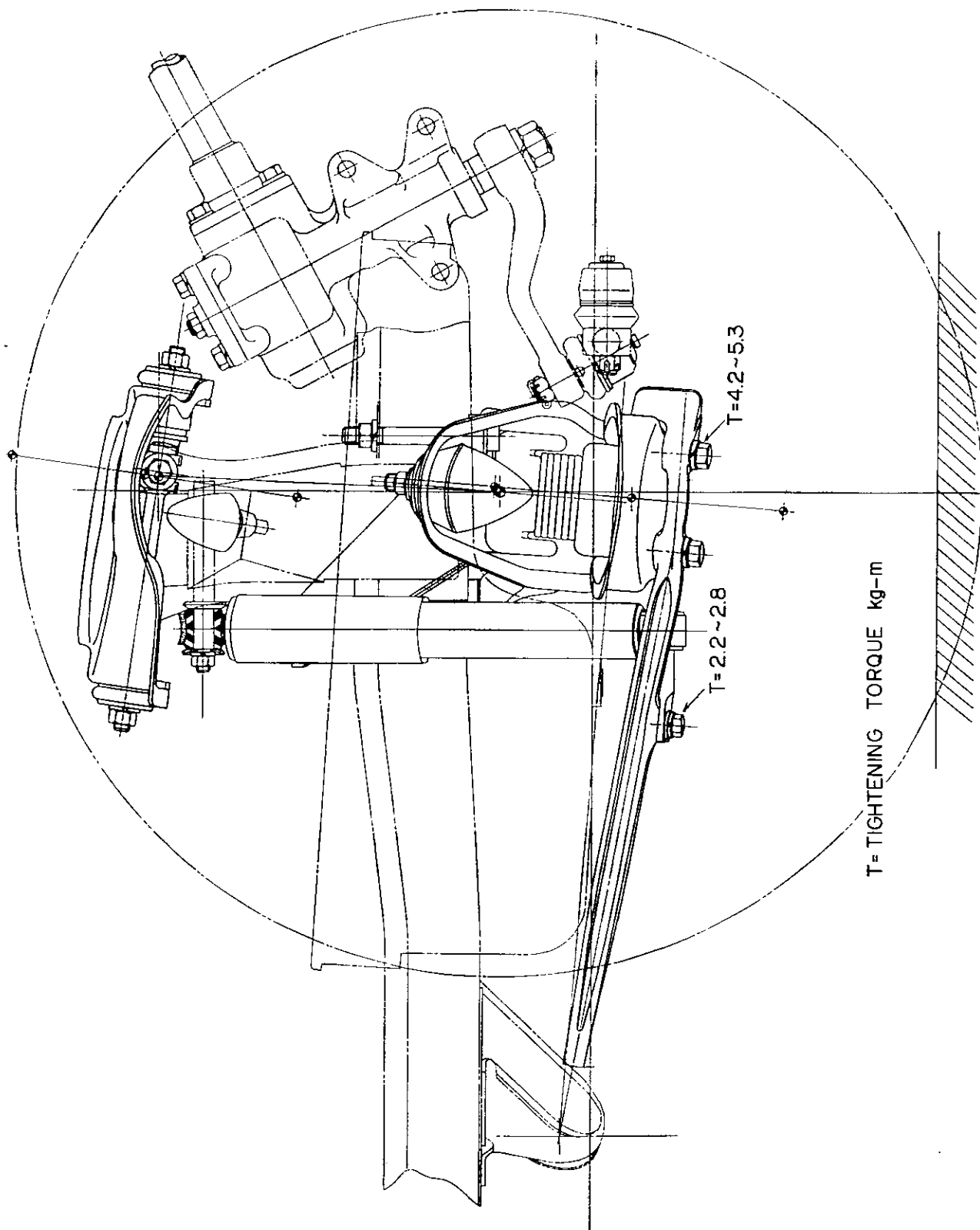
Assembling

Order of assembling is a reversal of disassembling.

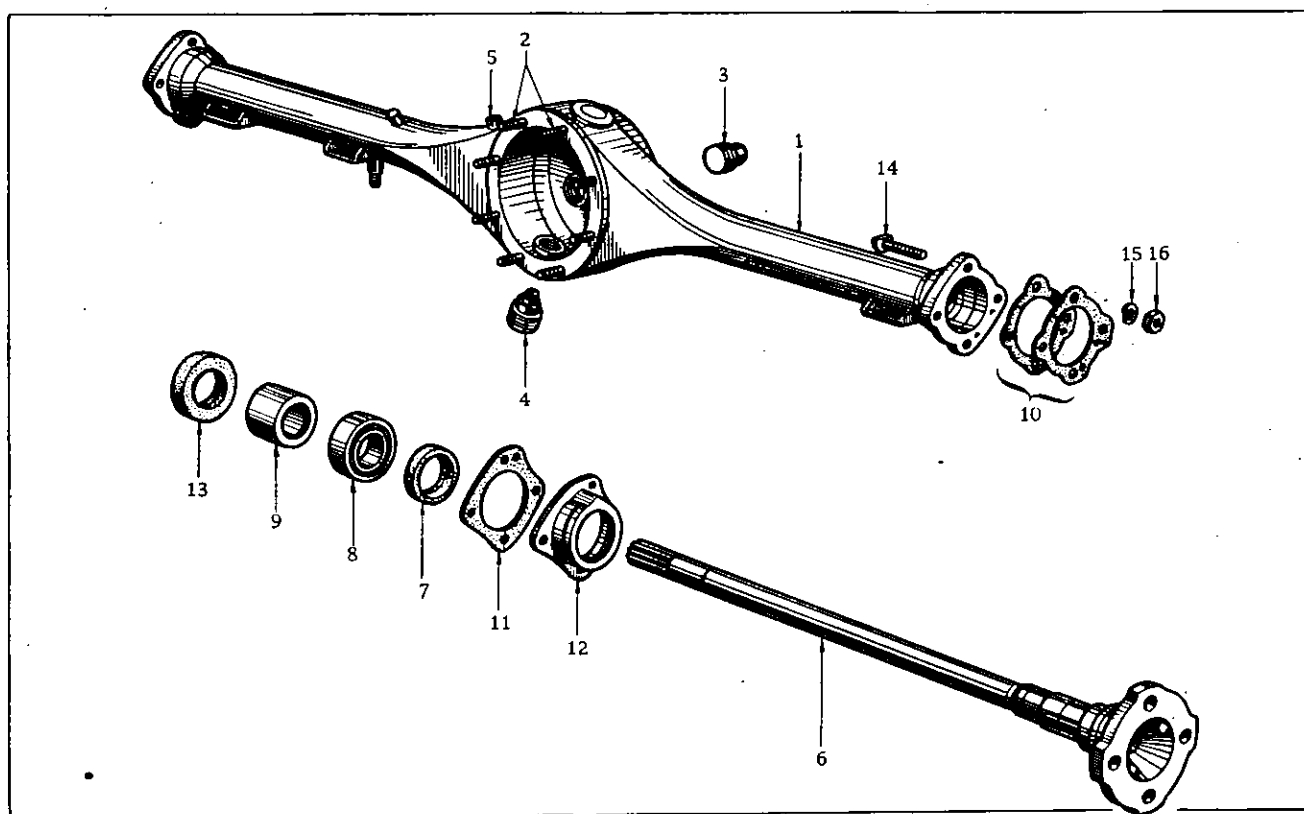
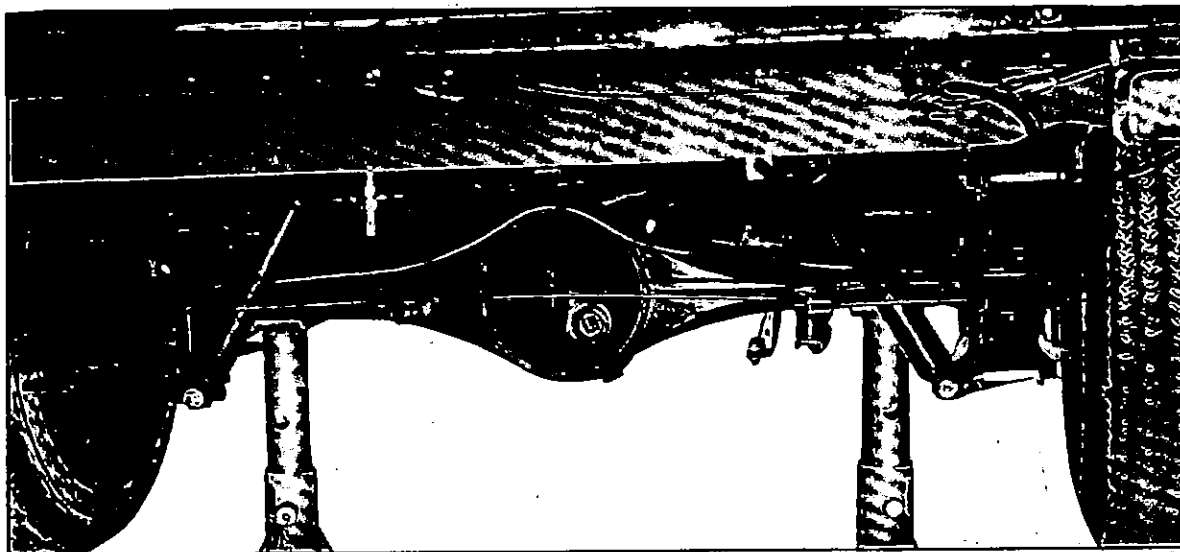
Tightening torque	kg-m
Lower ball joint	5.5 ~ 7.6
Lower link pin	4.2 ~ 5.3



SECTIONAL VIEWS OF FRONT
SUSPENSION

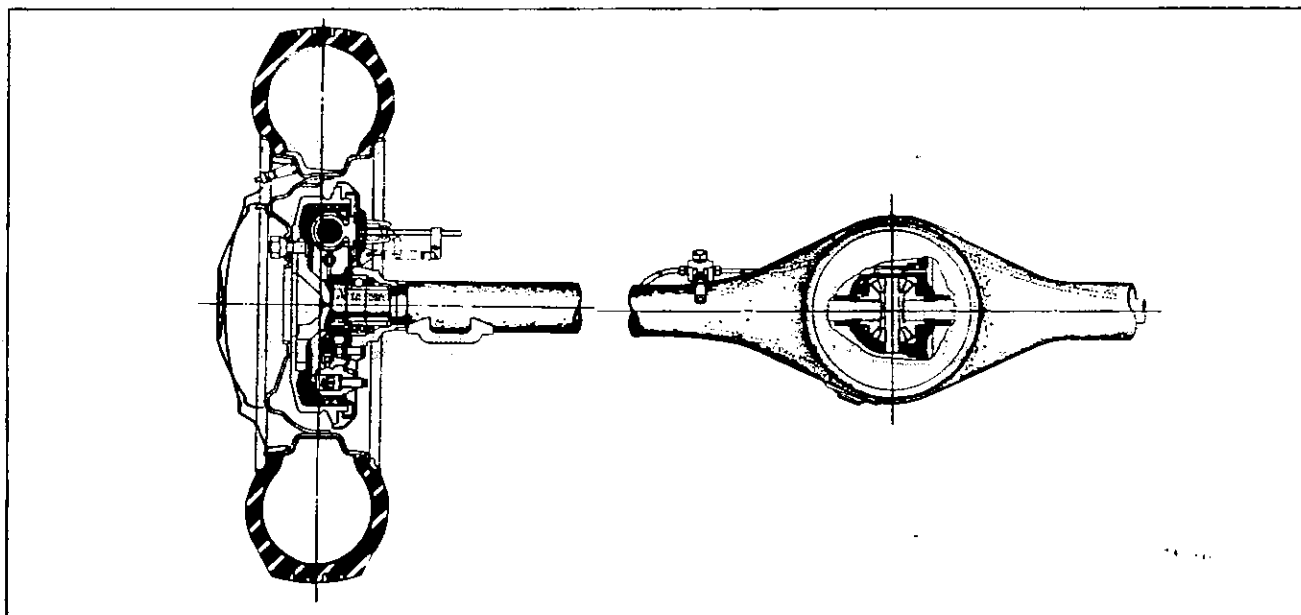


REAR AXLE



Rear Axle Case & Shaft

1	Comp. -case, rear axle	6	Ass'y-shaft, rear axle	11	Packing-grease catcher
2	Stud-gear carrier	7	Spacer-rear axle bearing	12	Catcher-grease (L.H.)
3	Plug-taper	8	Bearing-rear axle	13	Seal-oil, rear axle shaft
4	Ass'y-plug, drain	9	Collar-bearing, rear axle shaft	14	Bolt
5	Ass'y-breather (rubber)	10	Shim-rear axle case end	15	Washer-lock
				16	Nut-lock



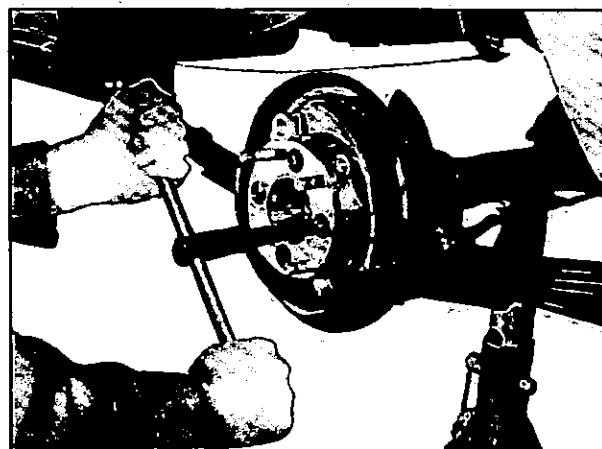
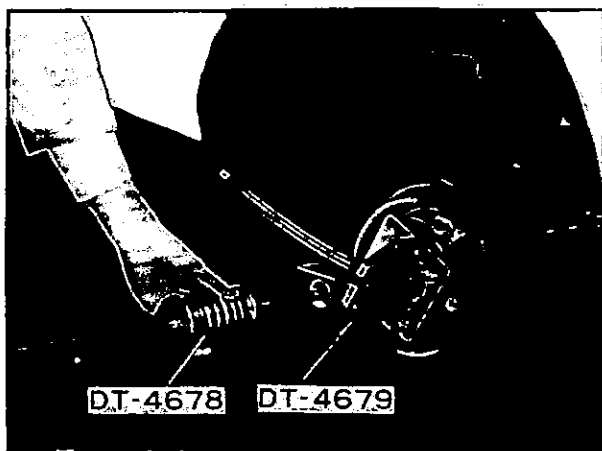
Component of Rear Axle

Axle Shaft Removal

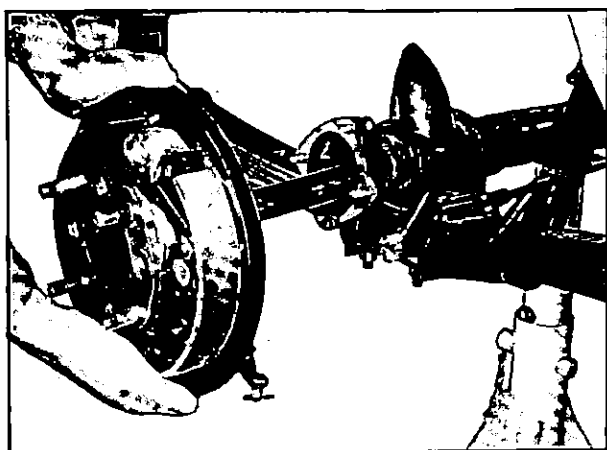
Choke all the wheels not being operated upon, jack up the car.

Lower the axle on to the blocks and remove the wheel using a screw driver unscrew the drum locating screws, release the hand brake and tap the drum off with the mallet. If the brake linings should hold the drum when the hand brake is release, slack off the brake shoe adjuster a few notches.

Take off the fix bolts of the brake disc and remove the axle shaft as shown Figure. Tap with swing hammer holding the wheel studs bolt with the rear axle shaft stand draw out the shaft and disc assembly by gripping it outside of the disc.



Remove of Axle Shaft and Disc Assembly

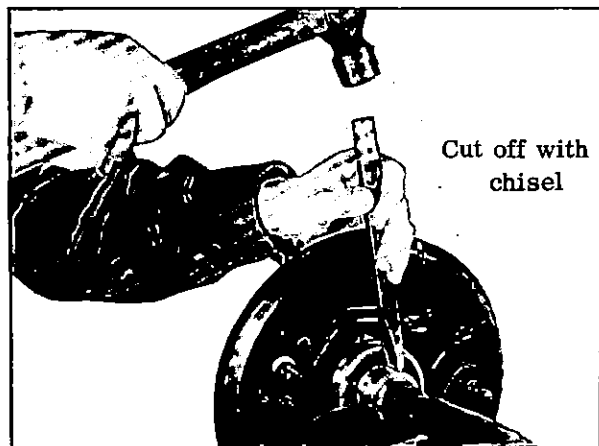


DT-4679
Special Stand

DT-4678
Swing Hammer

Disassembly and Assembly of Axle Shaft

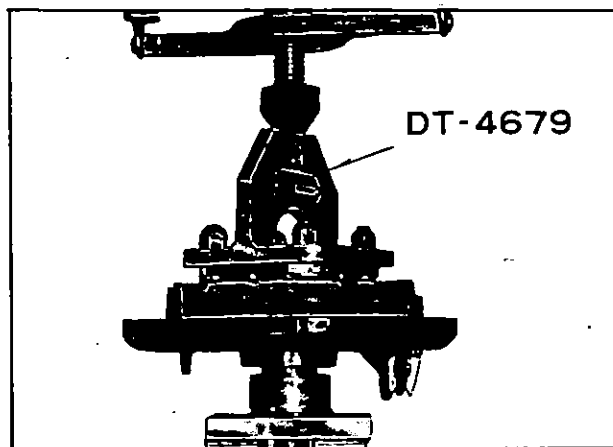
When replacing the differential axle shaft do not forget the adjusting washer between the top of the axle flange and the brake disc assembly so as to keep the end play of the axle shafts.



Order of Rear Axle Shaft & Brake Disc

The rear axle bearing with the brake disc assembly if replaceable in one operation by pressing into place. When fitting the axle shaft it should be compressed the bearing and new collar into the shoulder of the case end after inserting the end shim between its flange and hub.

The following points must be taken into consideration.



1. Nominated Hypoid gear oil No. MP90 must be used. (In warmer district than 32°C use MP# 140)
2. It is prohibited to use any other kinds of gear oil or any oil of different viscosity. The same brand must always be selected.

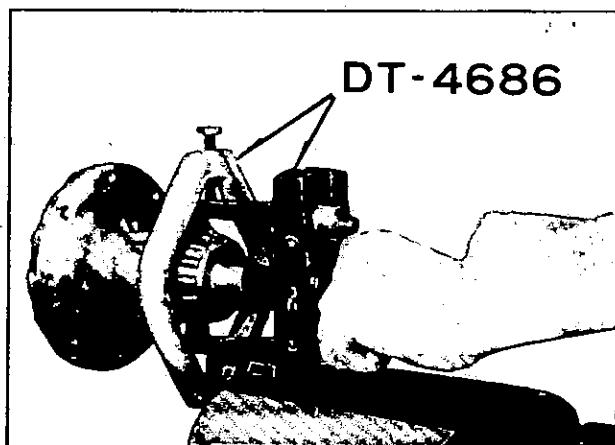
The standard capacity of oil is about oil 0.75ℓ. The method of feeding oil should be done by taking off the feeler plug at the rear cover of the housing and fill in full up to the feeding hole.

Dismounting & Disassembling of Differential Gear Carrier

- 1) Take off and drain out the gear oil.
- 2) At the time of dismounting the gear carrier, pull out the both left and right axle shaft with the disc of the brake assembly.
- 3) Take off the joint flange from the side of propeller shaft.
- 4) Pull off the nuts of the housing and dismount forward the carrier ass'y.
- 5) Take off the side bearing cap of carrier and pry with a lever the differential gear case and the bearing.
- 6) Dismount the differential side bearing. As illustrated in Figure with the aid of side

bearing puller, pull out the bearing. The puller should be handled with care in catching the hedge of bearing inner race which is hard to hook. Both the left and right bearing should be arranged separately.

- 7) Dismount the differential drive gear. (Ring gear) by loosening the 8 fixing screws on the differential gear case, and spreading out the lock washer. Loosen them in a diagonal line considering to keep from the gear bending.



*Using of Side Bearing Puller
(DT-4686)*

- 8) Take out the differential pinion as well as the side gear. The pinion mate shaft should first be pulled out by striking out the pinion mate shaft locking pin which is fixed on the differential case from left side (from the side of ring gear fixed) to the right before pulling out the pinion, side gear and the thrust washer. The gear as well as the thrust washer should be arranged separately as left and right, front and rear.
- 9) After taking out the nut of the carrier, pull out the companion flange. The drive pinion flange wrench should be employed, setting its four points in the holes of flange to keep it from moving, take off the nuts with the box wrench.
- 10) Take out the drive pinion of gear carrier by striking out lightly to the backwards the front end (at the side of companion flange) of drive pinion with the drift of soft metal.

Thus, the pinion would be taken out together with the inner race of rear bearing and roller, distance piece, and the adjusting shim and the oil seal, outer race and pinion of front and rear bearing as well as the pinion adjusting shim left in the carrier.

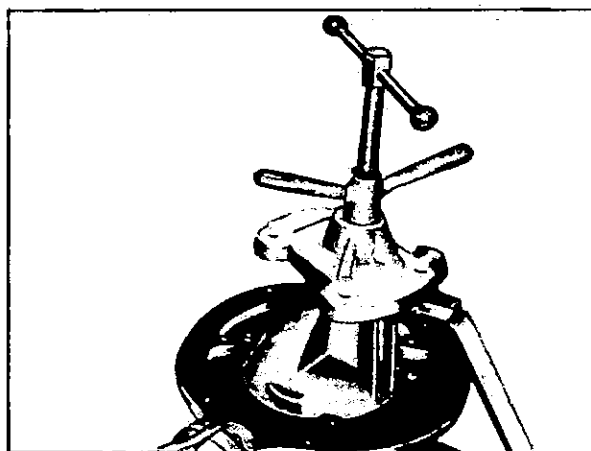
- 11) Pull out the rear bearing inner race of the drive pinion.

As illustrated in Figure the drive pinion rear bearing inner race replace and the adapter should be employed in this case. The adapter in the round from is for fixing and the other for taking off. It is easy to handle with the vice fixing one end of replacer.

- 12) Taking out the rear bearing outer race of gear carrier.

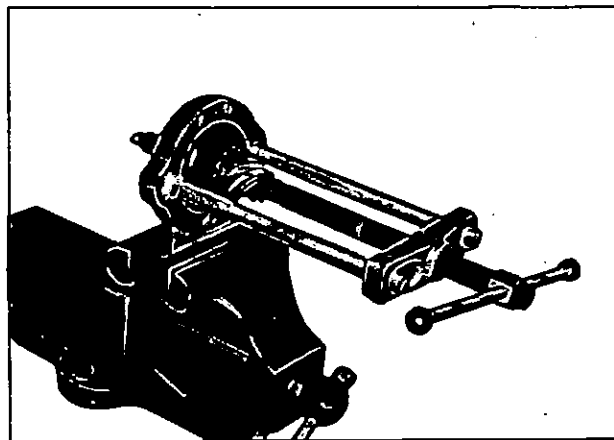
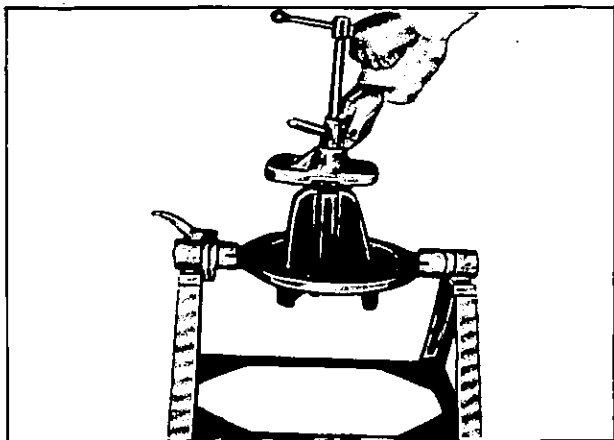
The drive pinion bearing outer race replacer as illustrated in Figure should be employed in this case. In other upon the stud so as to make the screw at the center of carrier, and set the adapter at the lower trim of the race.

Supporting the tommy bar (1) and screw up till the corn (7) closely touches the adapter, then screw the wing nut to take out the rear outer race.



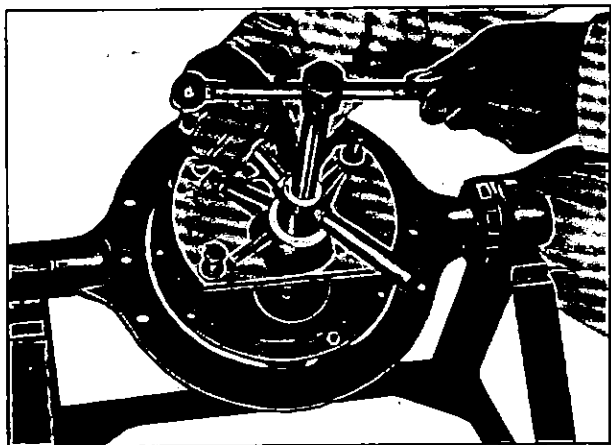
Tool No. DT4782, DT4631 & DT4689

Pull out the Bearing Race

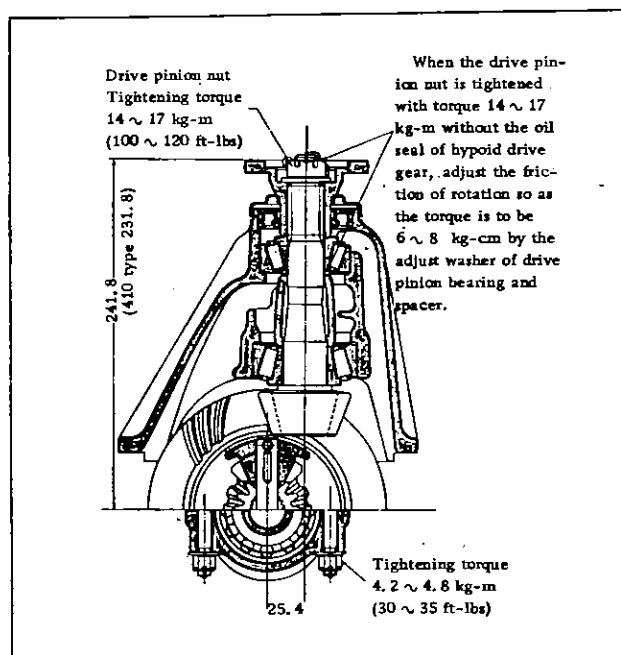


Inner Race Replacer

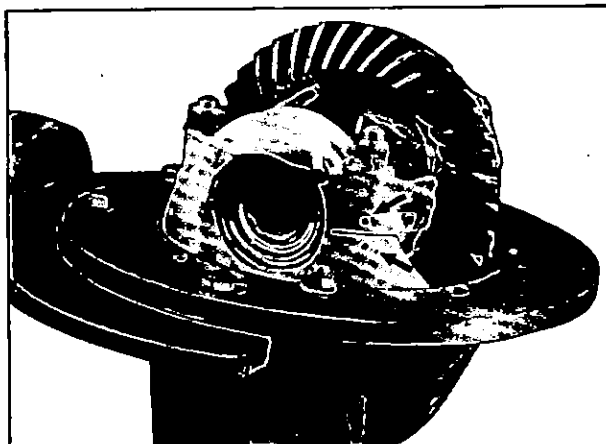
- 13) To pull out the front bearing outer race from the gear carrier, set the tool body (3) as illustrated in Figure pull it out with adapter (B) in the way of rear race.

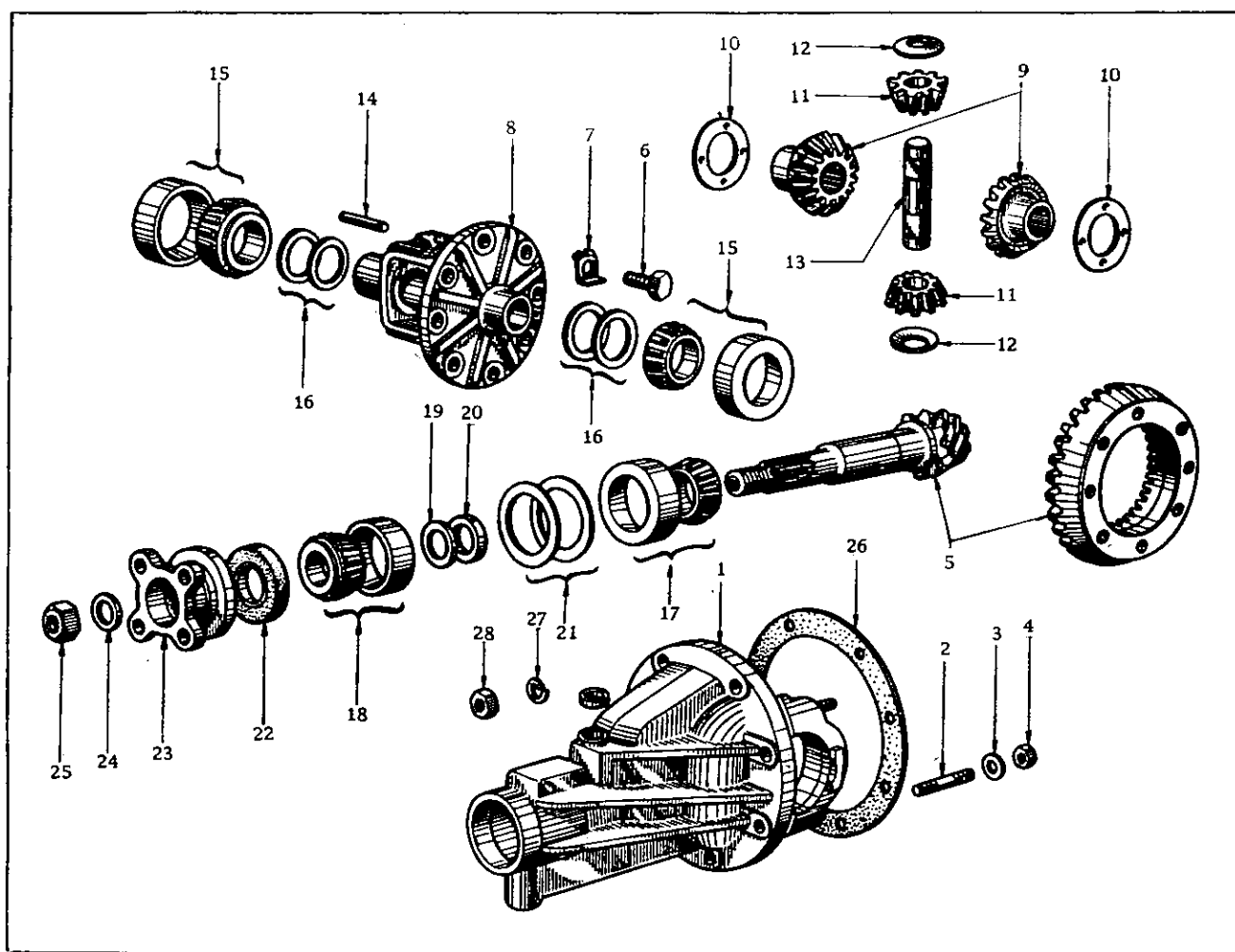


Drive Pinion Front and Rear Bearing Outer Race Replacer



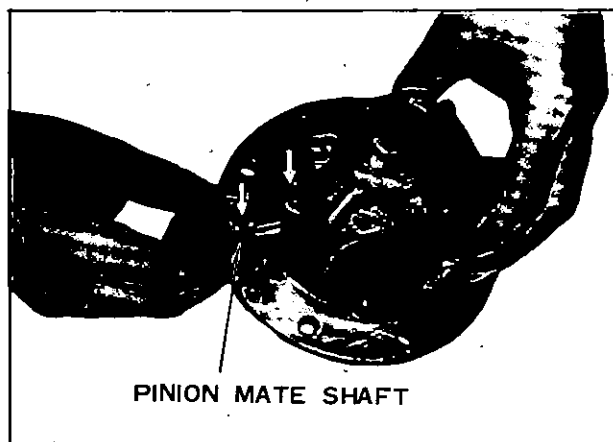
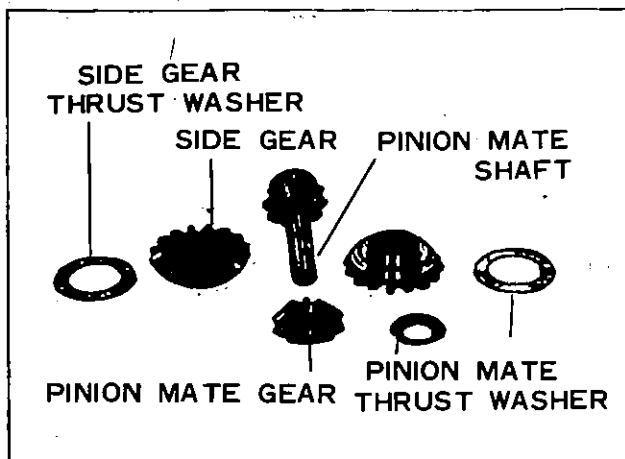
Section of Differential Case





Gear Carrier & Gear

1	Comp. -carrier, gear	15	Ass'y-bearing, differential side
2	Stud	16	Shim-adjusting, drive gear
3	Washer	17	Ass'y-bearing, drive pinion, rear
4	Nut	18	Ass'y-bearing, drive pinion bearing
5	Set-gear, hypoid with pinion	19	Washer-adjusting, drive pinion bearing
6	Bolt-drive gear	20	Spacer-drive pinion bearing
7	Strap-lock bolt	21	Shim-adjusting, drive pinion
8	Case-differential gear	22	Seal-oil, drive pinion
9	Gear-side, differential bevel	23	Ass'y-flange, companion & dust shield
10	Washer-thrust, side gear	24	Washer-plain
11	Mate-pinion, differential bevel	25	Nut-drive pinion
12	Washer-thrust, pinion mate	26	Gasket-gear carrier
13	Shaft-pinion mate	27	Washer-lock
14	Pin-lock, pinion shaft	28	Nut



INSPECTION & REPAIRING OF DISASSEMBLED PARTS

Every parts after they are disassembled should be cleaned and cleaned by the compressed air before making an inspection and adjustment.

- 1) Each bearing should be inspected in every unit of ass'y regard with the defect and defacement before deciding to re-use them.
- 2) The axle should be inspected in respect of the crack and the defacement of spline measuring the shake with the gauge by holding the both end. The difference over 0.4 mm should be adjusted with 0.8 m/m or replaced.
The clearance between the end of rear axle case and brake disc should be adjusted

with the adjusting end shim.

- 3) Every gear should be inspected as to the locking condition defacement or any defects on the surface to see if they can be reused. In case of insufficient standard back lash, deformation or damage found, replacement is necessary.
Specially the drive pinion and drive gear should be replaced in a set whenever the locking condition gets worse and the defacement is already in progress, because it would cause the noise in later operation and be difficult to adjust even with proper adjustment is made.

The perfect driving condition at the surface of drive pinion gear should be about from $2/3$ to $3/4$ mm in unloaded driving while the gear surface should start to touch from tip to full surface in an ordinary loaded driving.

The inspection of this condition can be made as it is.

If it is hard to inspect them as it is, do otherwise by cleaning the both surface with the rags before disassembling and paint thinly and evenly with the mixed with thin oil on the gear surface (drive side) then turn the pinion with hand to print the track of it on the gear. Which shows the situations of considerably worn out gear.

In case of unloaded test, it is perfect that the gears contact for about three quarter at the center of $1/4$ of whole gear length from tooth (interior tip end of the gear) on the pitch line.

- 4) Lock the side gear with pinion together with respective thrust in the gear case. In case of the back lash over 0.2 mm and the clearance between the side gear and thrust washer exceeds 0.5 mm replace the thrust washer.
The else worn out parts should also be replaced.
The contact when ring gear is too close to pinion center in case of back lash should be adjusted closely or it gives much noise.
- 5) Put the drive gear (ring gear) on the buoy block as it is fixed in the differential gear case, and measure with the dial indicator. Revolve the drive gear to turn around the differential gear case as the bearing do

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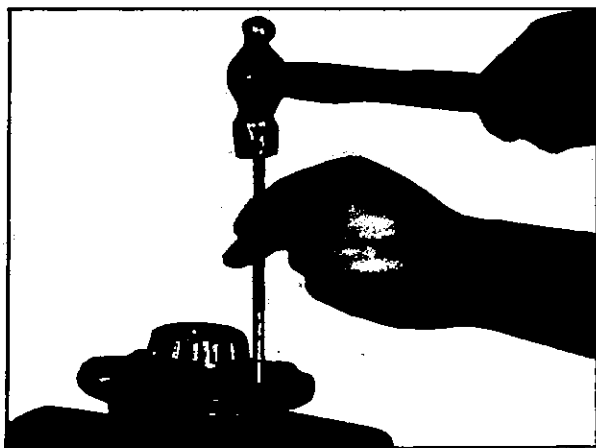
not move on the buoy block. Measure the shake at the rear side of gear by the scale and the shake should be within 0.08 mm. In mounting the gear, clean well the fitting face and rear face (measured face) of it and fix correctly, then there should not be any shaking.

ASSEMBLING ADJUSTMENT

Assembling Differential Gear

- 1) Assemble the pinion and side gear in the differential case.

Every parts should be cleaned and oiled with new gear oil, then the pinion mate side gear and the thrust washer should be assembled by the mentioned inspection and selection before pushing in the pinion mate to shaft. Inspection should be made again in the clearance of between the washer or the back lash. Adjustment must be made in case any abnormal, is found. Strike in the pinion shaft locking pin from the right side of the case (opposite side of drive gear) and must be fixed by setting well the striking hole of it after putting it to the required piston so as the pin should not loosen.



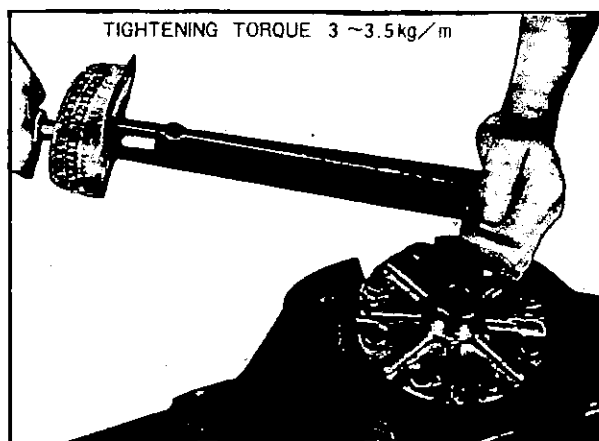
- 2) Fix the drive gear (Ring gear) with the differential case.

The drive gear as well as the drive pinion should be well inspected to they must be replaced as a set whenever the replacement is required.

Otherwise, they would not properly lock after assembling is completed.

In mounting in the case, the fitting surface

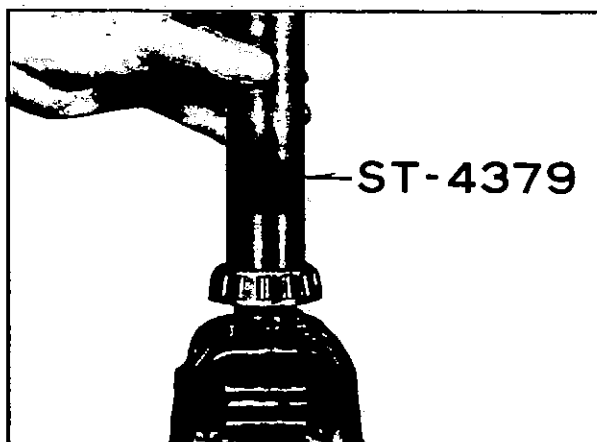
must specially be cleaned and fixed with 8 set screws as well as lock washer bend the washer with sureness after the drive gear shake is adjusted. In tightening up the screw, it should be set and supported by vice or any other setting tools so as not to damage it and screw up in a diagonal line with a wrench which fit correctly with the head of the screws. The standard screwing torque for this is 3~3.5 kg-m. Screw in for sure, striking lightly the head of screw by one quarter pound hammer.



- 3) Mount the side bearing in the differential case.

Press in the both side of the bearing by the drift.

It is important in this case to assemble by putting the side bearing adjusting shim to give the bearing a proper preload in fixing with the carrier.

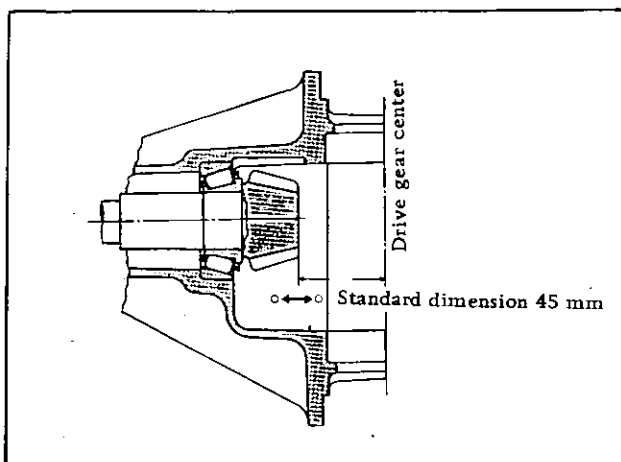


ASSEMBLING & ADJUSTMENT BY GEAR CARRIER ASS'Y

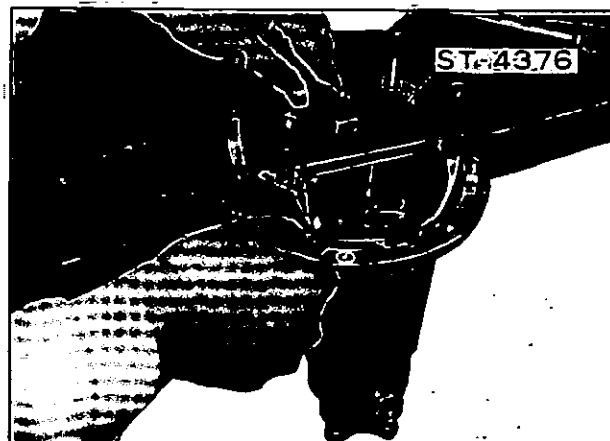
It is to decide the assembling & adjustment of gear which is very important in an rear axle ass'y and should be carried in accordance with the exact sample shown by the manufacturer.

The construction and mechanism must well be comprehended referring to Figure and the adjustment & repairing exactly according to the condition of practical use based on the adjustment by exact calculation.

(A) The Preparation for Mounting the Drive Pinion in the Gear Carrier



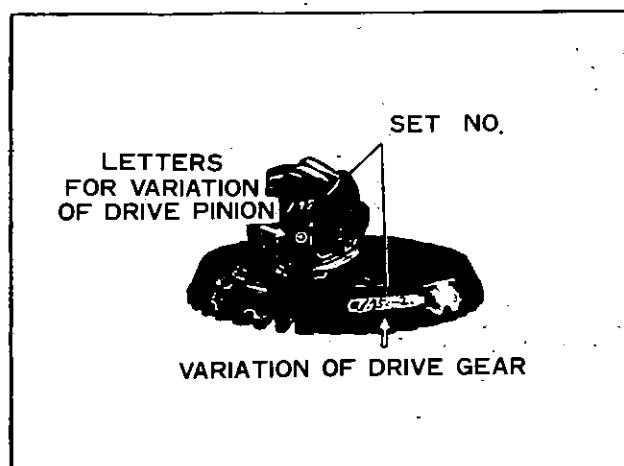
- (1) If the drive gear, drive pinion, and bearing are to be reused as they are as a result of disassembling and inspection, they should be assembled in the same order of disassembling at the previous condition of adjusting shim. In case any item should be replaced or required to reuse even if any item is worn out prepare the various shim as mentioned later because the position of drive pinion to be fixed with carrier must be adjusted by the adjusting shim between the carrier and pinion rear bearing outer race.
- (2) There are few numbers with 0 & + or - besides set number marked by an electric pen on the tip head surface of drive pinion.



Adjustment of Pinion Height

They show the manufacturing variation in a figure at the unit of 0.001 in. (0.025 mm) to decide the thickness of adjusting shim for adjustment of standard position. (The standard pinion height is 45 mm from axle center as shown in Figure.)

If the figure is difficult to discriminate due to the corrosion, scrape off the oxidize substance on the surface by a somewhat narrow grind stone with care not to scrape off even the mark. Adjust to the direction of on arrow in accordance with the Pinion mark.



- (3) The thickness of drive pinion adjusting shim are arranged as following. The use of the adjusting shim will be explained in the following paragraph

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of adjustment. Supposing the drive gear and the drive pinion were replaced as a new set and the height of drive pinion previously used was right, prepare the shim of thickness which equals to the difference of figures on the new and this pinion. Deduct the previously used shim in case it is plus, increase in case of minus and have the general idea of required thickness of the shim for assembling to prepare.

	Part No.	Thickness
Drive pinion adjusting shim	38153 18000	0.050 mm
"	38154 18000	0.075 mm
"	38155 18000	0.125 mm
"	38156 18000	0.250 mm
"	38157 18000	0.500 mm

It is convenient to inspect the condition before disassembling in a way as mentioned later in the measurement of pinion height. Besides the condition of defacement on the carrier, the pinion bearing must be taken into consideration though it will be explained in detail later.

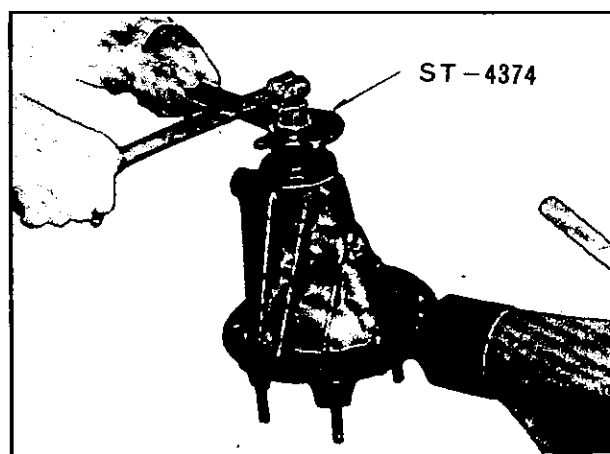
(B) Fixing and Adjustment of Drive Pinion

- (1) Drive pinion rear bearing outer race should be mounted in the carrier in this case, after inserting the properly selected adjusting shim as previously mentioned between the carrier and bearing race, mount the outer race by the special tool of drive pinion front, rear bearing outer race replacer.

For adjustment of previously mentioned pinion height, the shim at the rear side of this outer race is increased or decreased, and the race also must be taken off in each time for this adjustment, therefore the tools must be handled properly to avoid such a

situation as to make the bearing hole of carrier in on oval.

Referring to Figure for handling method of tool, set the adapter ring on the corn to guide the body of tool at the small hole of carrier put the rear outer race on the corn as the bearing surfaces inside at the tip end of screw and put the split adapter inside race. At the same time, supporting it by the bar, twist up the corn till the adapter and race come to the setted position then screw up the wing so as the race be housed properly at the setted postion.

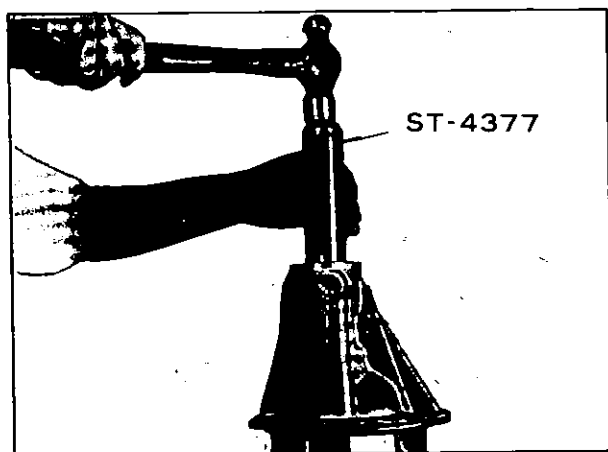
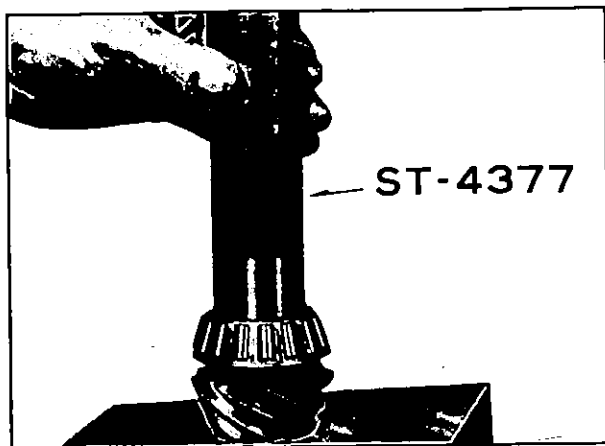


- (2) Mount the front bearing outer race in the carrier.

For mounting the front outer race, take off at first the adapter from the front end of the carrier and fix the tool at the side of stud in opposite side, tighten the screw as to be the center of carrier as shown Fig.24 then mount it by using adapter as in a way of mounting the rear outer race.

- (3) Mount the rear bearing inner race and roller to the drive pinion. By using the round adapter attached to the drive pinion rear bearing inner race replacer which was employed at disassembling, press in the drive pinion.

This might as well be done in pressing in by the use of a certain drift.



- (4) Mount the drive pinion in the carrier and adjust by measuring the position. The pinion height must be adjusted as mentioned in the previous paragraph by mounting temporarily the pinion in the carrier and the bearing be given a regular preload. On the other hand, the bearing of drive pinion should be newly oiled after the pinion is inserted from the inside of the carrier, the inserted end of pinion should be locked with front bearing cone and tightened up by the pinion nut fixing with the companion flange till the regular revolving torque is required. As this is not yet at the final assembling, the bearing spacer (distance piece), bearing adjusting shim and oil seal are not mounted.

At the time of inserting the front

bearing, as pushing in the inner race by pulling out the drive pinion from the rear side of the carrier.

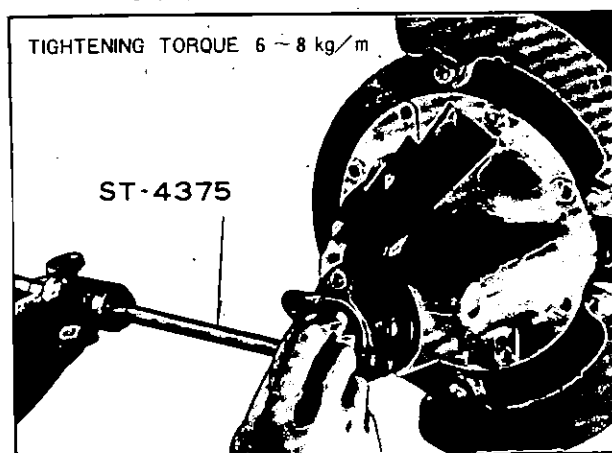
Put the rear side of the carrier downward and set the tool under it, then supporting the end surface of drive pinion, press in the bearing by using the drift. The operation would be easier by using the drive pinion front bearing inner race inserter as shown in.

Tighten up the pinion nut by turning it slowly with hands with the use of preload gauge as Figure to the degree that support the bearing preload at 6~8 kg-cm.

When the drive pinion is mounted in the previously mentioned condition it is necessary to measure the height of rear surface of the pinion whether in is higher or lower than the standard. Make use of the special drive pinion arrangement gauge.

The standard height of the pinion is 45 mm from the bottom of the side bearing fixed with the carrier.

The fixing position can be measured by setting an arc of circle on both sides of arrangement gauge at the position of side bearing and insert the thickness gauge in the clearance between the tip of gauge bar and the pinion such as to push in by scraping of the carrier in diagonal, otherwise preload and the pinion height of the bearing would come out of order and tend to cause an unexpected trouble in future.

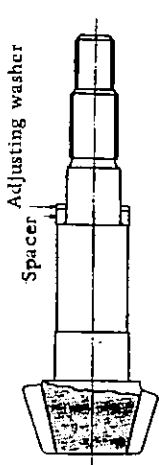


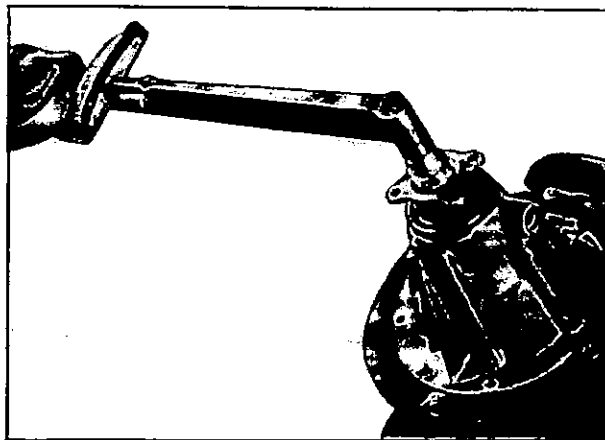
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Drive Pinion Spacer

Part No.	Thickness mm
38165 18000	5.75
38166 18000	6.00
38167 18000	6.25

Drive Pinion Adjust Washer

Part No.	Thickness mm	
38125 18000	2.30 ~ 2.32	
38126 18000	2.32 ~ 2.34	
38127 18000	2.34 ~ 2.36	
38128 18000	2.36 ~ 2.38	
38129 18000	2.38 ~ 2.40	
38130 18000	2.40 ~ 2.42	
38131 18000	2.42 ~ 2.44	
38132 18000	2.44 ~ 2.46	
38133 18000	2.46 ~ 2.48	
38134 18000	2.48 ~ 2.50	
38135 18000	2.50 ~ 2.52	
38136 18000	2.52 ~ 2.54	
38137 18000	2.54 ~ 2.56	
38138 18000	2.56 ~ 2.58	
38139 18000	2.58 ~ 2.60	

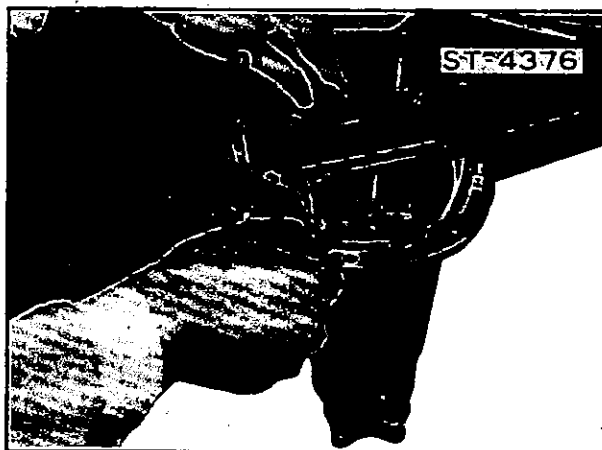


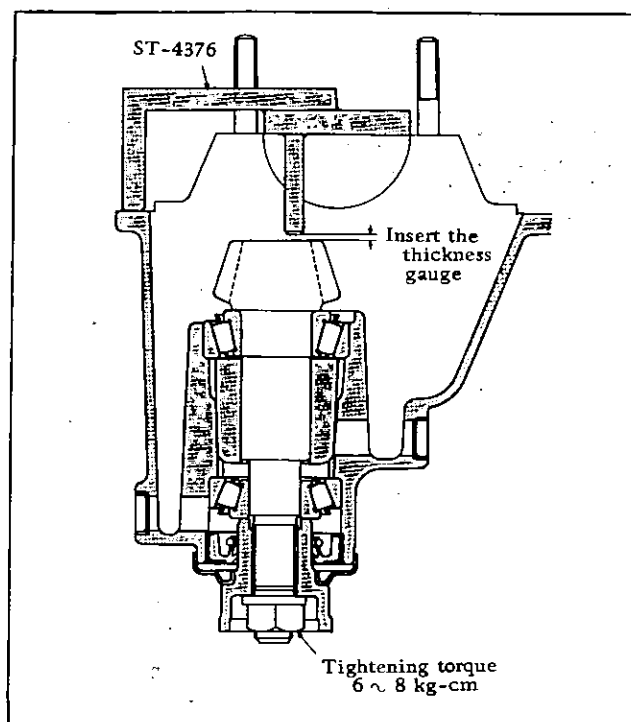
the bearing preload in this case, it must be adjusted by increasing or decreasing the number of four kinds of adjusting shim as shown in the following list and measuring with the use of the drive pinion bearing preload gauge as Figure so as to make revolving torque of pinion at 6~8 kg/cm if there should not by an error in the pinion with the head mark at 0 and the clearance should be sealed at 0.2 mm (0.008 in.) by the feeler gauge, thus pinion is regarded as at the correct position because the height of the gauge is made shorter for 0.2 mm than the standard size (45 mm).

- (5) The formal adjustment of the drive pinion, bearing and preload. After the fixing position of drive pinion is decided as mentioned in the previous paragraph, take off the pinion nut & companion flange to mount again the drive pinion bearing spacer (distance piece) and nut. Tighten up the nut as Figure by using the torque wrench at the regular torque of 14 ~ 16.8 kg-m. The preload supportedly the bearing in this case is different according to the condition of the bearing adjusting shim inserted.

The more of the shim inserted, much the play of pinion to the direction of axle is increased.

The less of the shim inserted, the more the bearing tightened by the previously mentioned nuts and cause it to be burned if left and turned as it is. Therefore, for readjustment of





Remarks

When measuring the height of the pinion head, set the semi-circular side portions of the gauge on the side bearing seats; insert a feeler gauge into the clearance between the tip of the gauge center rod and the pinion head, and adjust the pinion. The gauge rod is made 0.2 mm (8/1000 in.) shorter than the standard measurement (45 mm).

Therefore, adjustment is made by selecting a feeler gauge in accordance with the plus or minus value marked on the pinion head.

If it is necessary to adjust the pinion height, take off the drive pinion as well as pinion rear bearing outer race from the carrier to adjust by increasing or decreasing the number of the adjusting shim. In other words, read the mark on the head of the drive pinion, before adjusting by increasing or decreasing the number of drive pinion adjusting shim to insert the feeler gauge which is deducted for the number of mark from 0.008 in. in case of minus side added for the number of mark to 0.008 in. in case of plus.

For instance, the mark shows +2, adjust the position of drive pinion by deducting the number of shim so as to make the clearance at 0.008 in. + 0.002 in. = 0.001 in. it is necessary to give the bearing a right preload. At the time of pushing the outer race into the carrier, it must be done in a right way, otherwise.

Specially when the old bearing is to be used again in assembling, the adjustment should be made at the lower torque than standard in accordance with the conditions of practical use so as not to give it an over preload.

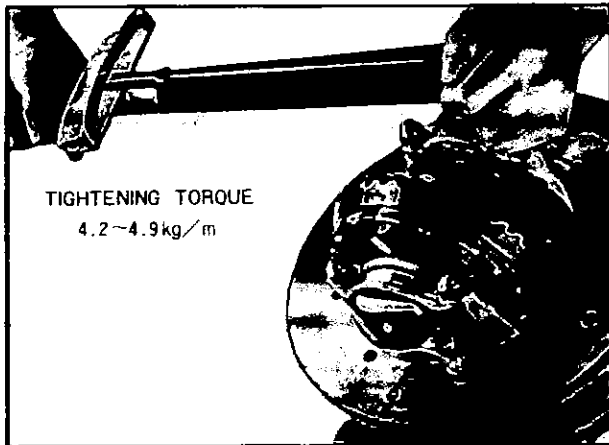
- (6) When the former adjustment of preload of the bearing is completed as in the previous paragraph, inspect the pinion height again. Unless anything wrong is found, loosen the pinion nut, take off the flange, insert the new oil seal in the rear of the carrier and formerly fix the flange, washer and pinion nut. The nut should be tightened up at the standard torque. In case the cotter pin hole fitted, the adjustment should be made not by tightening the nut, but by filling the washer.

(C) Mounting the Differential Gear Assy in Carrier

- (1) Mount the complete unit of differential gear in the carrier and fix the bearing cap. There is an engraved mark on the side of cap which should be fitted with mark on the leg of bearing housing when mounting. It is important to note that the fixing part of the cap of each bearing housing is machinery finished up.

The differential gear case is inserted by the bearing adjusting shim with the side bearing as explained in (3) of (A) and by housing in the bearing housing of carrier, the bearing must be given the regular preload. The screwing torque of the fixing nut of the side bearing cap is at 4.2~4.9 kg-m and should be equally locked with fixing cotter pin.

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So far, only the differential unit is mounted and the drive gear is locked with the drive pinion, therefore, the following adjustment must be made to acquire the regular side bearing preload & the gear back lash.

(2) Adjustment of side bearing preload & back lash.

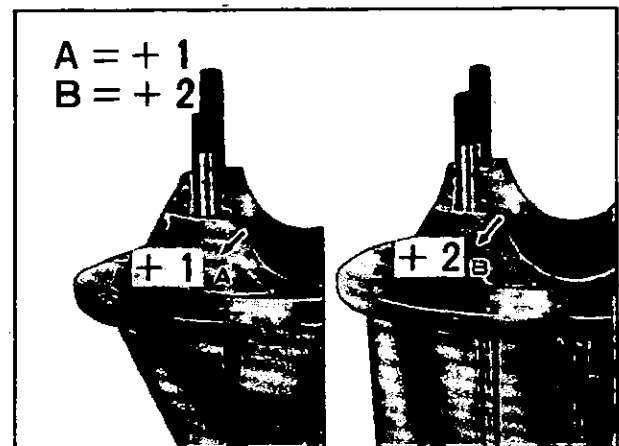
To give the right preload on the side bearing of differential gear case and in pressing the bearing in the differential case adjust by inserting inside the bearing adjusting shim of thickness calculated in accordance with the following method of computation. There is a marked numeral of adjusting basis on the bearing housing of the gear carrier and differential case. The numeral is the manufacturing error in a unit of 1/1000 in. against each standard measurement of A.B. C.D. in Figure.

To measure the width of the side bearing on left and right, use the standard gauge (17.5 mm thickness) and dial gauge on a flat board. In this case, place the load on the bearing with the aid of weight block for about 2~2.5 kg to acquire the steady figures. Calculate the error on minus side against the each standard measurement of 17.5 mm on the unit basis of 1/1000 and assume each of them as E & F. Take the left side bearing, for example. When the measured

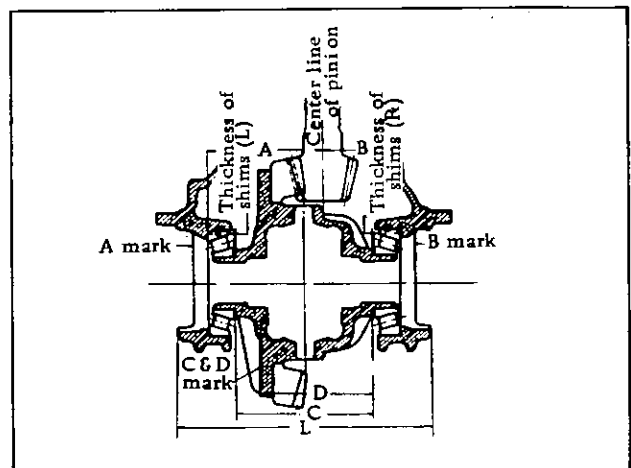
width is 17.3 mm it is -0.2 mm (0.008 in.) against the standard measurement and the E is, by excluding the minus sign, 0.008 in.

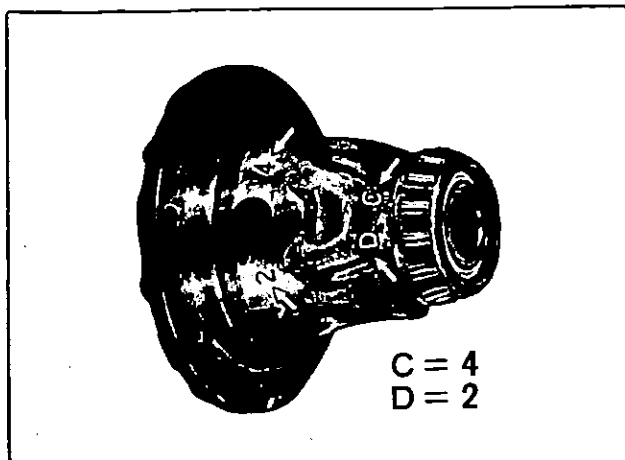
The thickness of the shim is acquired by applying the numerals to the following method of computation.

It may as well be assembled by using the shim of thickness which is in accordance with above method of computation. The left and right bearing must be well pressed in otherwise the preload changes.



Measure the back lash of the drive pinion & ring gear as Figure by using the dial indicator to make sure that it is within 0.1 mm-0.2 mm (0.004"-0.008"). If it is much, move to left by taking off the right shim, for adjustment.





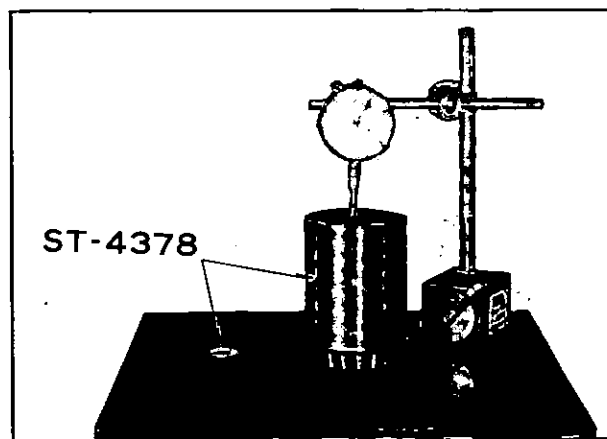
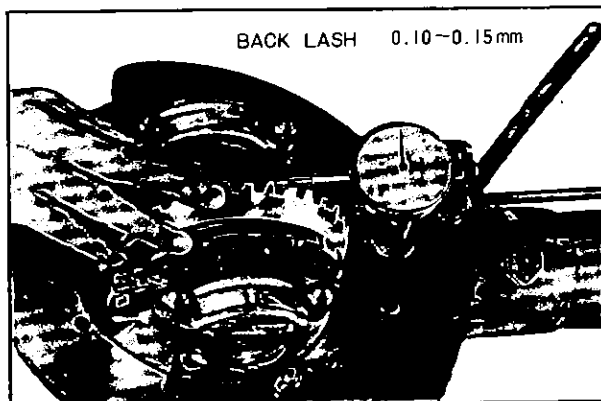
A example of calculation

A = +1, B = +2, C = -1, D = +3, N = +2,
E = 0.2, F = 0.15

$T_1 = (+1 - (-1) + 3 - 2 + 8) \times 0.025 + 0.2 =$
0.475 mm (Thickness of the shim on the L
side)

$T_2 = (2 - 3 + 2 + 8) \times 0.025 + 0.15 = 0.375$
(Thickness of the shim on the R side)

The numeral marked by the electric pen on the side of the drive gear shows that of the recommended back lash besides the set number.



Thickness of shim on
the left side
(Ring gear side)

$T_1 = (A - C + D - N + 8)$
 $\times 0.025 + E$ mm

Thickness of shim on
the right side
(Pinion mate side)

$T_2 = (B - D - N + 8)$
 $\times 0.025 + F$ mm

* A, B : Letters on the flange of gear carrier
C, D : Letters on the diff. case
E, F : Difference the standard width between
E & F

Remarks: + (plus means the valve less than
standard width 17.50 mm
N : Letters on the drive gear (variation)

After the Operation

If it is necessary to use the bearing again at the time of repairing, the thickness of each shim of left & right must be reduced for 0.001"-0.003" on the basis of 80% or 60% against standard preload in accordance with the practical condition of use, because over preload is given to the bearing with the shim of thickness calculated from above method of computation.

Side Bearing Adjusting Shim

Part No.	Thickness (mm)
38453 18000	0.050
38454 18000	0.075
38455 18000	0.125
38456 18000	0.250
38457 18000	0.500

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Mounting the Gear Carrier Ass'y on the Rear Axle Housing

Interior of the axle housing should be cleaned well.

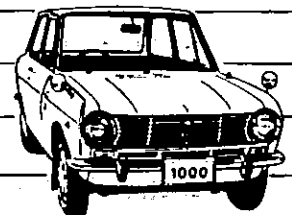
The carrier packing should also be replaced with new one.

Mount the gear carrier ass'y without mistaking it upper side with down side and through 8 studs, then fix with the lock washer & nut. The

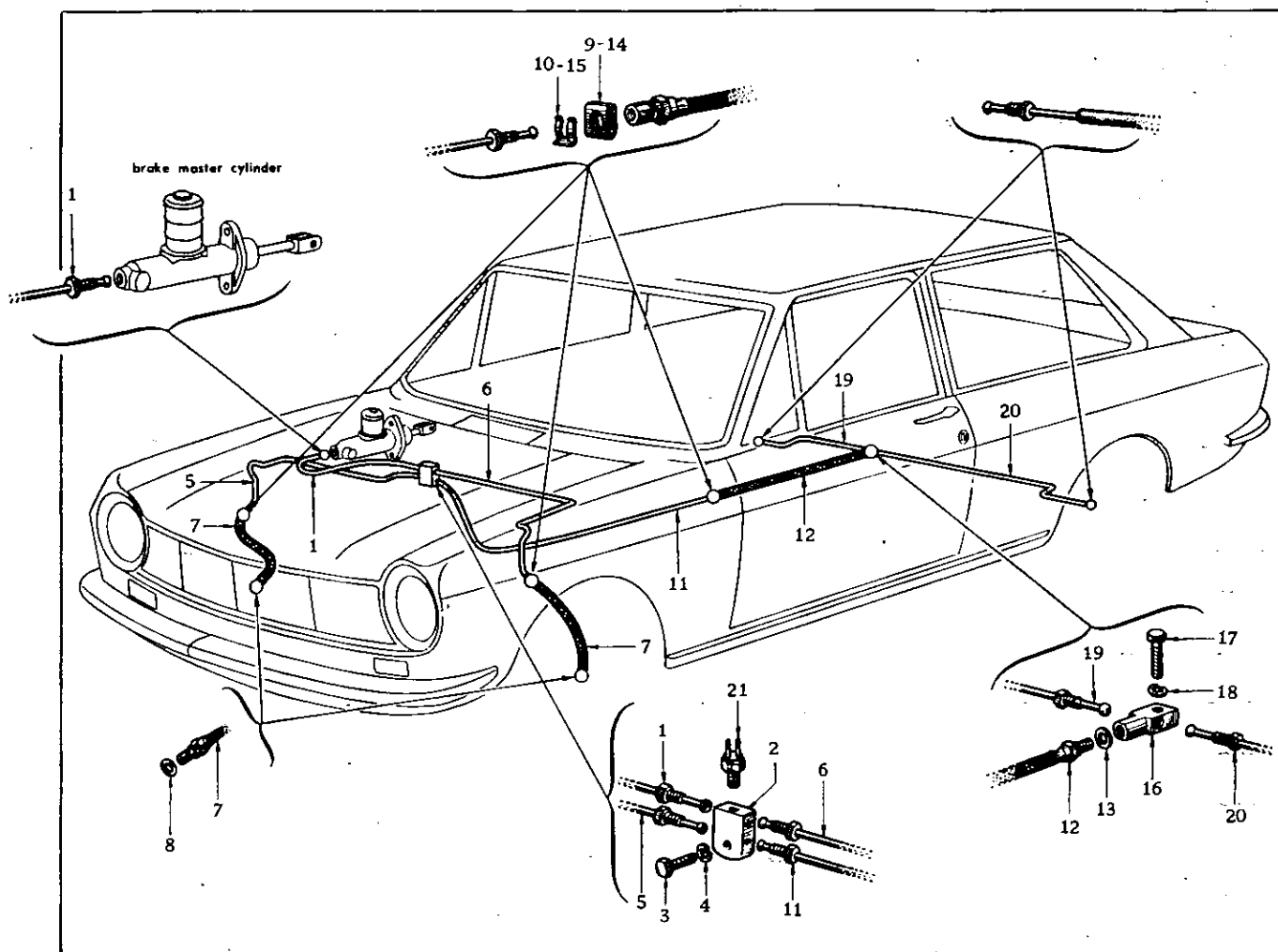
nut must be tightened in a diagonal line so as not to cause the oil leaks.

When it is mounted on the vehicle, feed the gear oil immediately. The oil of the designated hypoid gear oil No. 90 should be feed.

Feed the oil till it comes up to the down side of the feeding hole.



BRAKE SYSTEM

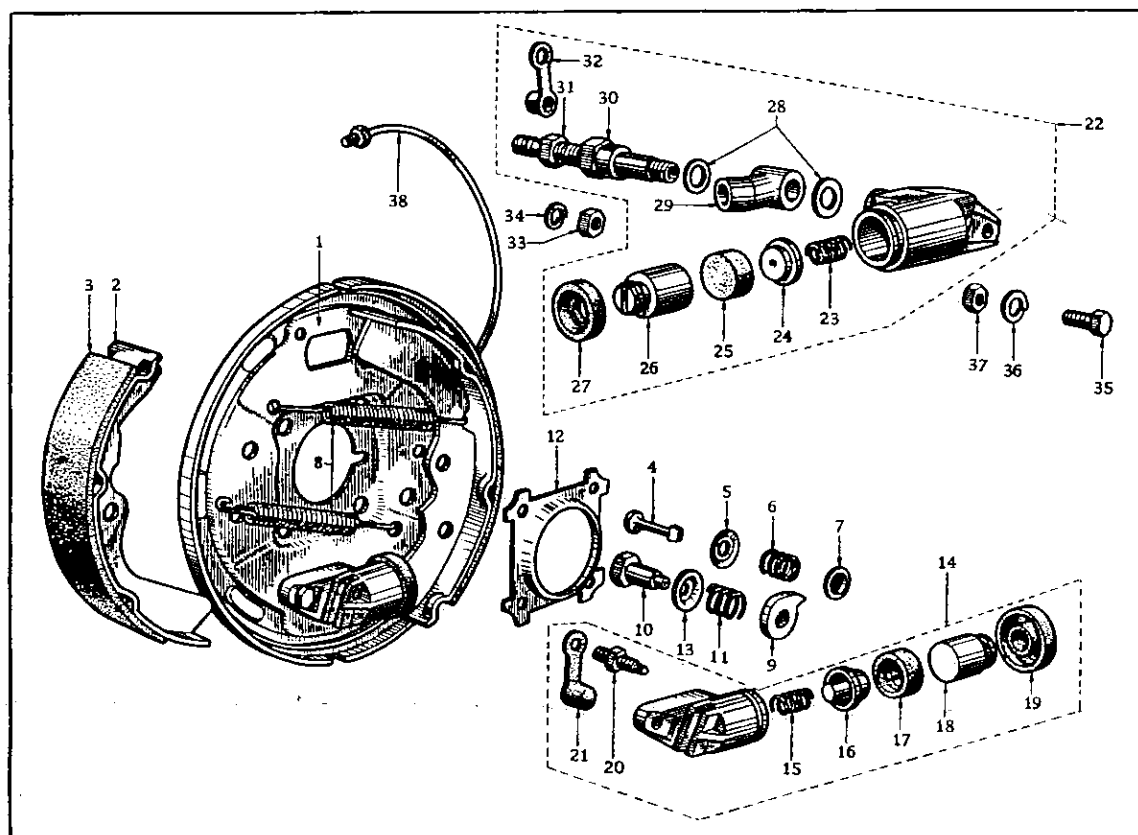
*Brake Piping*

A hydraulic brake system on four wheels and a mechanical hand brake on rear wheels.

1	Ass'y-tube, brake master cylinder to 5 way connector	8	Gasket-brake tube	15	Spring-lock
2	Connector-brake tube 5 way	9	Plate-lock	16	Connector-brake tube 3 way
3	Bolt	10	Spring-lock	17	Bolt
4	Washer-lock	11	Tube-brake rear	18	Washer-lock
5	Ass'y-tube, front brake (R.H)	12	Ass'y-hose, brake	19	Ass'y-tube, brake rear (R.H)
6	Ass'y-tube, front brake (L.H)	13	Gasket-brake tube	20	Ass'y-tube, brake rear (L.H)
7	Ass'y-hose, brake	14	Plate-lock	21	Ass'y-switch, stop lamp

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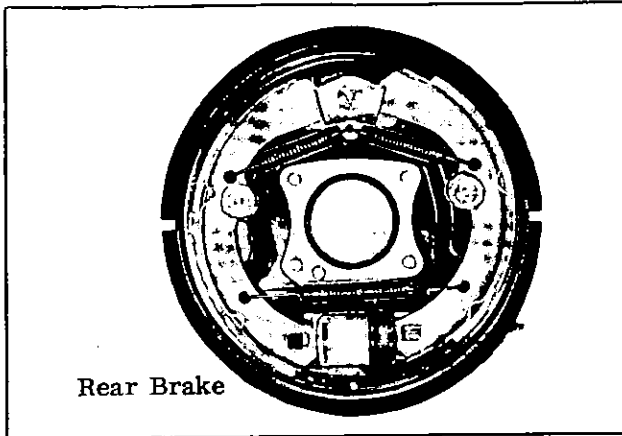
	Front	Rear
Type	2 leading	Leading-trailing
Drum diameter	203.2 mm	203.2 mm
Master cylinder dia.	17.46 mm	
Wheel cylinder dia.	20.64 mm	
Max. oil pressure	175 kg/cm ² (100 kg/cm ²) by foot	
Remained pressure	0.3 ~ 0.7 kg/cm ²	
Lining material	Akebono B40	Akebono B40
Lining dimension (L. x W. x Th.)	35 x 195 x 4.8 mm	35 x 195 x 4.8 mm
Lining area	273 cm ²	283 cm ²
Hand brake type		Mechanical for rear wheels



Front Brake

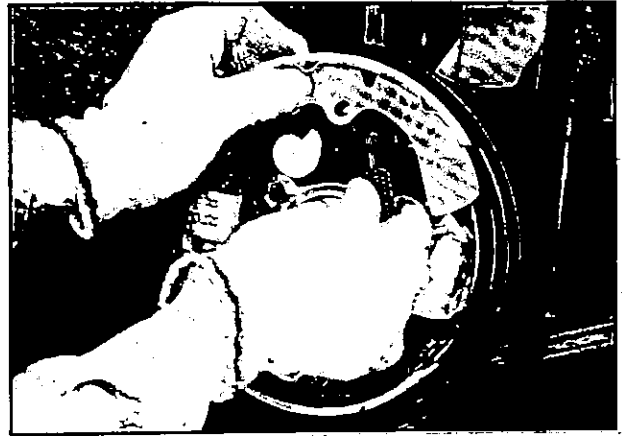
1 Ass'y-disc, front brake	14 Ass'y-cylinder, front wheel, fore	27 Cover-dust
2 Ass'y-shoe, front brake	15 Spring-piston	28 Packing
3 Lining-brake	16 Seat-spring	29 Connector
4 Pin-anti shoe rattle	17 Cup-piston	30 Bolt-connector
5 Seat-spring	18 Piston-cylinder	31 Screw-bleeder
6 Spring-anti shoe rattle	19 Cover-dust	32 Cap-bleeder
7 Retainer-shoe rattle	20 Screw-bleeder	33 Nut
8 Spring-return	21 Cap-bleeder	34 Washer-lock
9 Cam-adjusting	22 Ass'y-cylinder, front wheel, after	35 Bolt
10 Stud-adjusting cam	23 Spring-piston	36 Washer-lock
11 Spring-adjusting cam	24 Seat-spring	37 Nut
12 Baffle-front brake disc	25 Cup-piston	38 Ass'y-tube, bridge front
13 Spacer-adjusting cam	26 Piston-cylinder	

Front Brake Drum



Raise the body until the wheel and tire clean the floor and remove the wheel and tire from the hub.

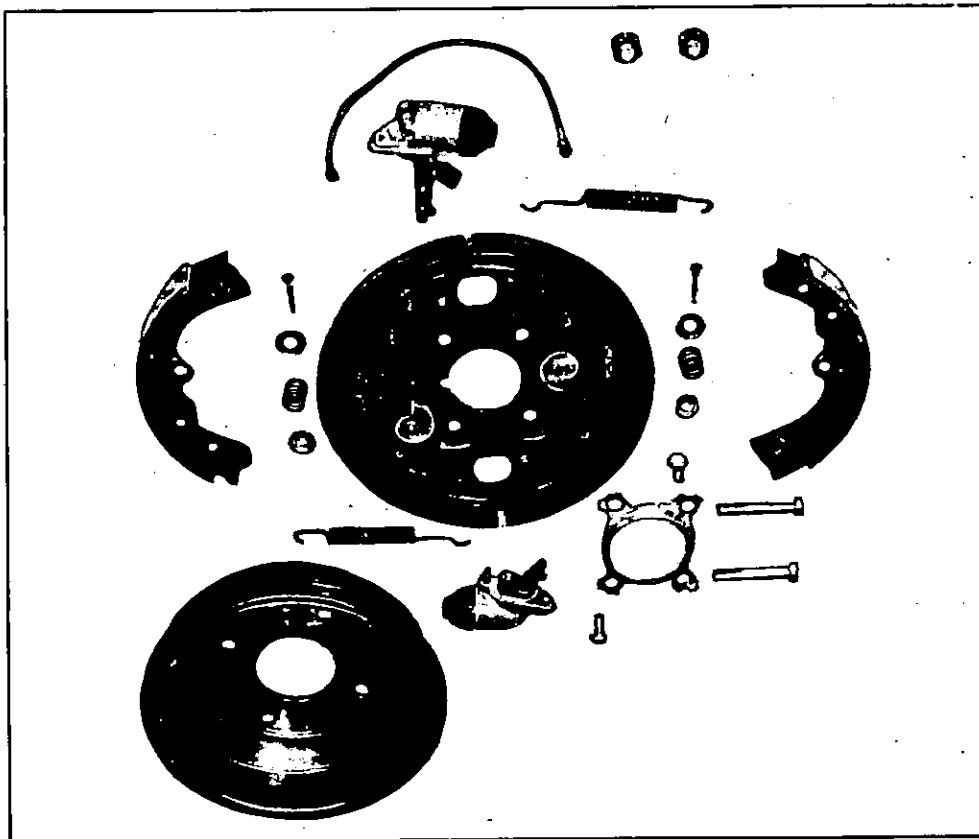
Remove the brake drum from the hub.
Check the drum for defects or wear.



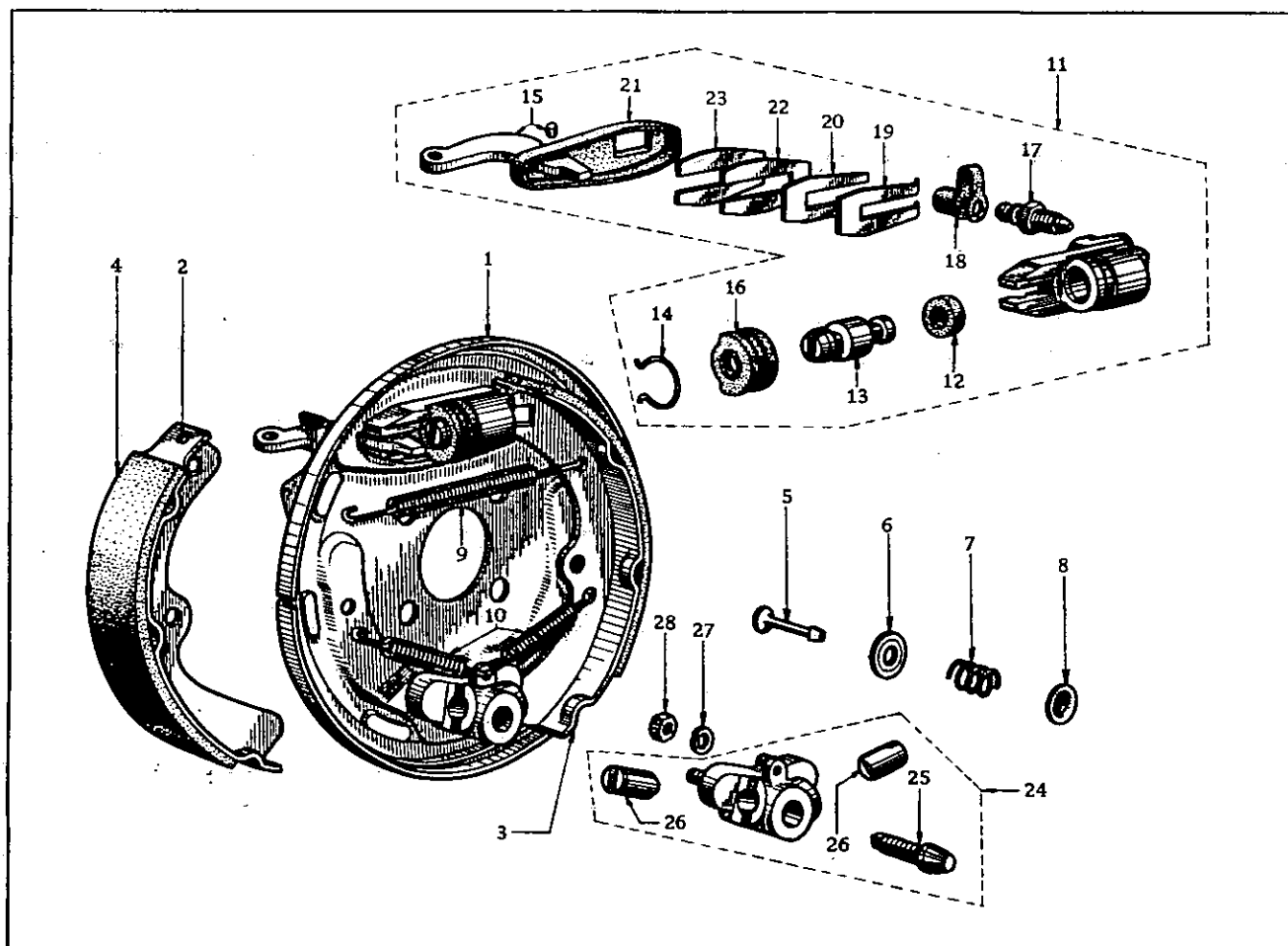
Detach the return spring and remove brake shoes.

Disconnect bridge tube, flexible tube and wheel cylinder.

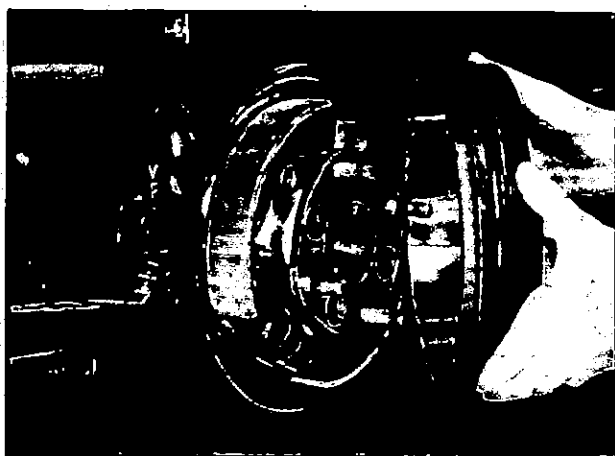
Remove the disc from spindle.



Component of Rear Brake

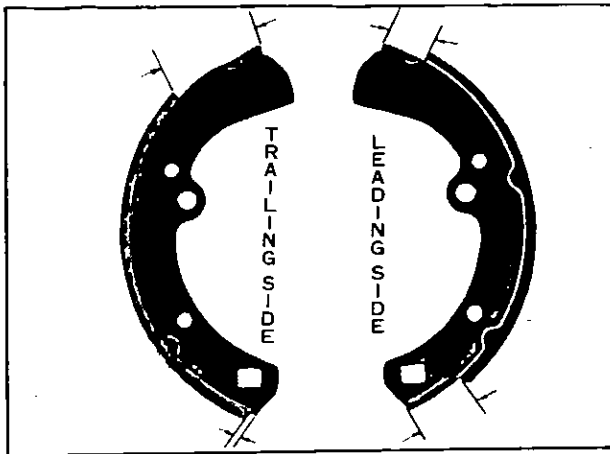


Rear Brake



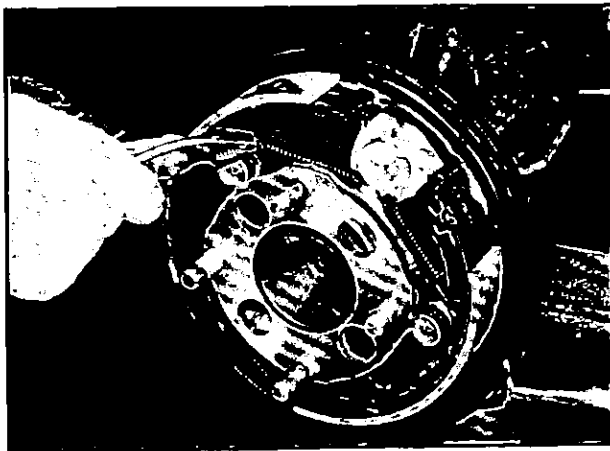
1	Ass'y-disc, rear brake	14	Ring-snap
2	Ass'y-shoe, rear brake fore	15	Ass'y-lever
3	Ass'y-shoe, rear brake after	16	Cover-dust A
4	Lining-brake	17	Screw-bleeder
5	Pin-anti shoe rattle	18	Cap-bleeder
6	Seat-spring, anti shoe rattle	19	Shim-adjusting A
7	Spring-anti shoe rattle	20	Shim-adjusting B
8	Retainer-shoe rattle	21	Cover-dust B
9	Spring-return, brake shoe cylinder	22	Plate-A
10	Spring-return, brake shoe adjusting	23	Plate-B
11	Ass'y-cylinder, rear wheel	24	Ass'y-adjuster, rear brake
12	Cup-piston	25	Wedge-adjuster
13	Piston-cylinder	26	Tappet-adjuster
		27	Washer-lock
		28	Nut

Disassembling the Rear Brake



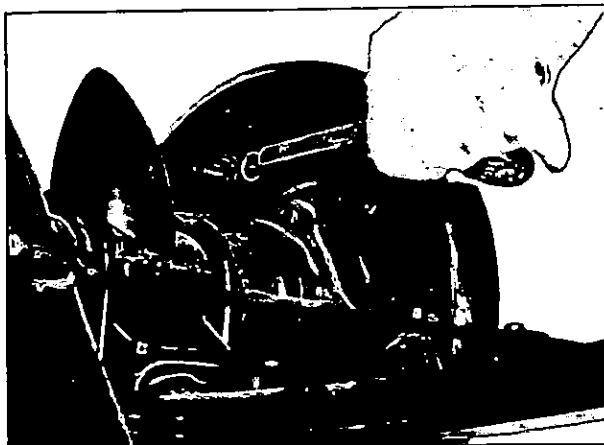
Take off the wheel and brake drum on the stand.

Detach the return spring by a spring plier or plier, and take off anti-rattle.

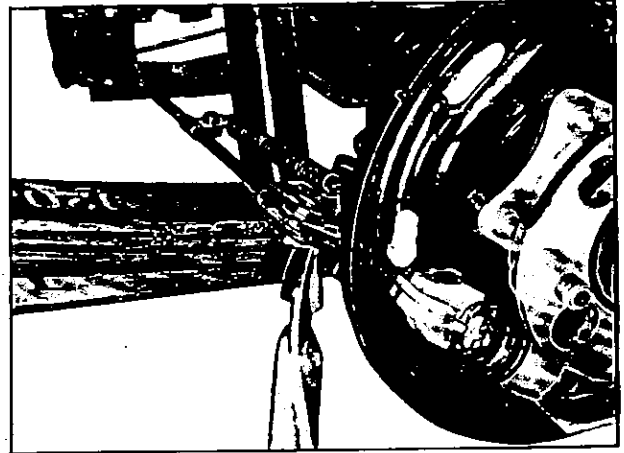


Removing Return Spring

Detach the shoes and adjuster from the flange.

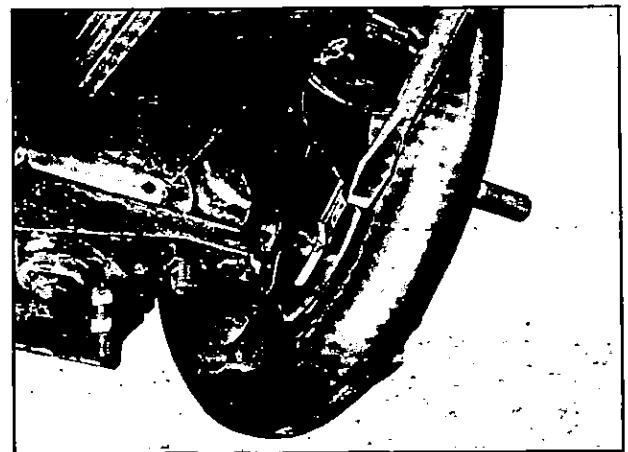


To remove the wheel cylinder, detach the spring at side brake cross rod and pull out the pin of cross rod end.



Disconnect the brake tube from back of flange.

Push out the plate.



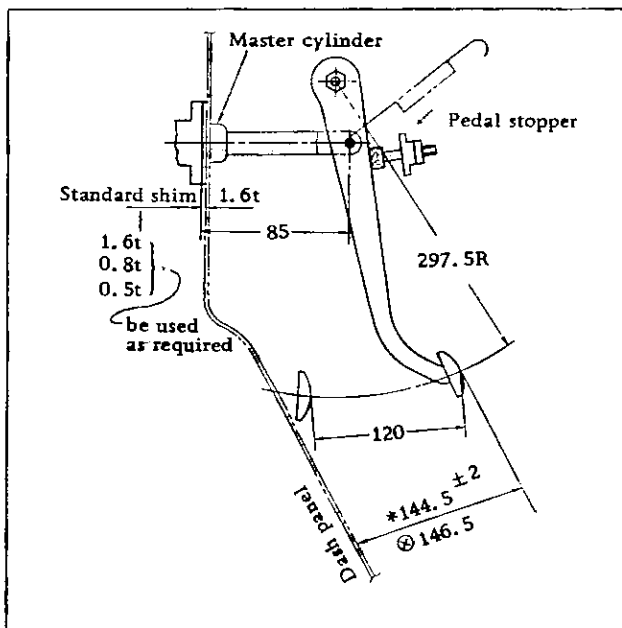
Assembling is a reversal of disassembling.

The Brake Pedal Adjustment

	Thickness	Part No.
Adjusting shim for master cylinder	1.6 mm	30611 27260
	0.8 mm	30612 22760
	0.5 mm	30613 32760

When the brake pedal free-travel, which is the movement of the brake pedal before the push rod touches the master cylinder piston, the

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pedal should be adjusted by the adjusting shims.

To check pedal free travel check, push the brake pedal down by hand pressure, and check the free travel. Select adjusting shim from 1.6 mm, 0.8 mm and 0.5 mm size. Adjust the brake pedal height $\odot 146.5$ mm when stopper is free from lock nut, and then lock stopper at the dimension of distance $*144.5 \pm 2$ mm as shown in the figure.

Bleeding the Hydraulic Brake System

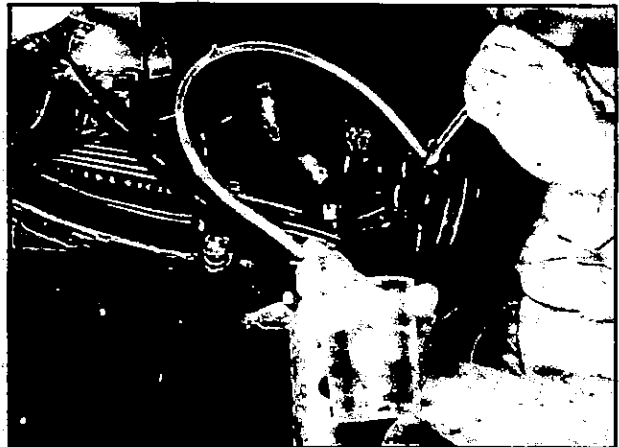
Bleeding should be carried out at first by the nearest wheel from the master cylinder

Thoroughly wipe the bleeder connection end from any mud or dust present, so that the outlet

hole is free from foreign matter.

Connect a vinyl hose to the wheel cylinder bleed valve.

Dip the end of the vinyl hose in a jar containing some brake fluid.



Push out the bleeder valve several turns and work on the brake pedal, depressing it quickly and releasing slowly repeatedly until no air bubbles are evacuated from the bleeder valve.

Keeping pedal pressed down, retighten the bleeder valve and remove the vinyl hose.

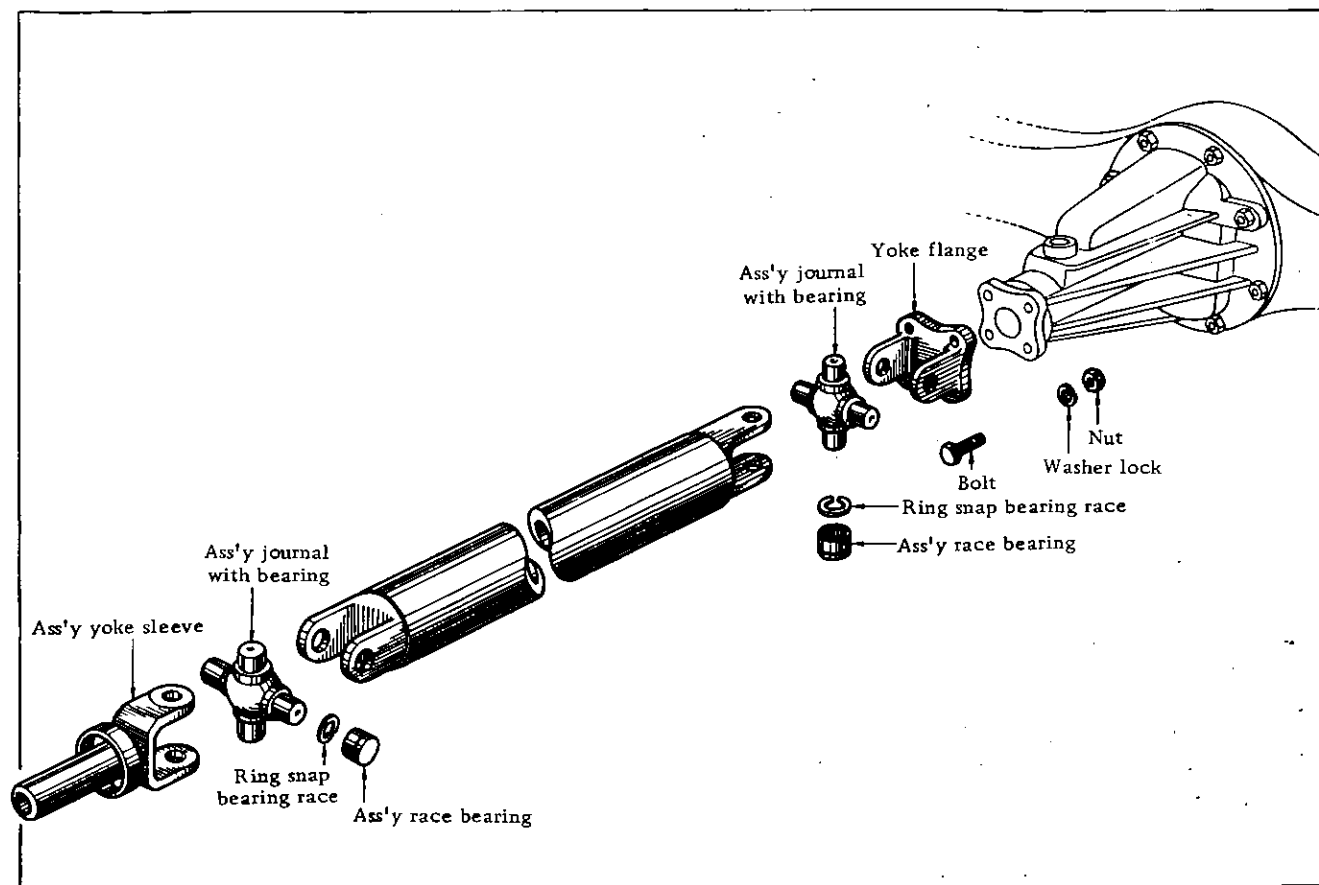
Repeat the above said procedure *Fill up brake fluid in the reservoir.

When bleeding the hydraulic lines, never let the fluid level in the reservoir tank drop below the plate contained in the tank.

Fluid with drawn in the bleeding operation should not be reused.

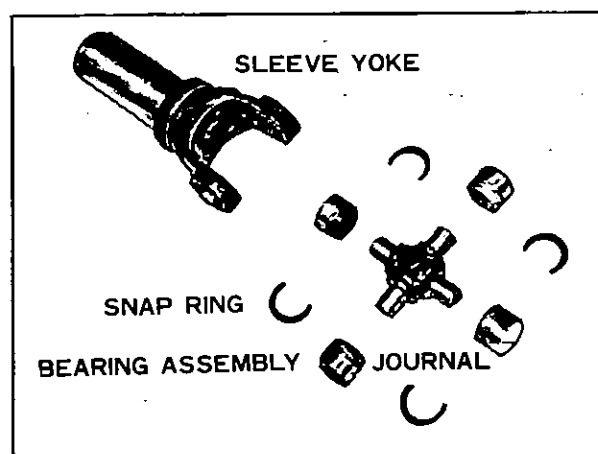
Full up the reservoir with new one.

PROPELLER SHAFT



Propeller Shaft

Distance between joints	1178 mm
Tube outer diameter × thickness	63.5 mm × 1.6 mm
Sleeve yoke specification	Involute spline
Out dia. × inner dia. × pitch	20 × 80 × 1 mm
The allowance of unbalance	15 g-cm/4000 r.p.m.
<p>Check the joint every 40,000 km (24,000 mile).</p> <p>If an abnormal bending (such as a play or noise) is seen, replace the journal & bearing race and make an adjustment by the snap ring.</p>	



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Removal

Disconnect the flange yoke and the pinion flange by removing bolts at the rear end of the propeller shaft.

In this case, draw out the sleeve yoke from the end of transmission, holding the disconnected rear end of the propeller shaft.



Before disassembling, mark all components of shaft so as to assemble them in the former position and avoid that the propeller shaft balance may be some how affected.

Universal Joint

Remove snap rings from yoke place the propeller shaft in a rise.

Remove the snap rings secured the journal bearings in the yoke flange with a pair of pliers.

If the snap ring does not snap out of the groove, tap the end of the bearing with wooden hammer slightly. This will relieve the pressure against the snap ring.

Remove slightly on the end of the journal bearing until the opposite bearing is pushed out of the yoke flange. Turn the assembly over in the vise and drive the first spider bearing back out of its lug by driving on the exposed end of the spider.

Use a brass drift with a flat face.

Wash and clean the bearing and shaft with cleaning solvent.

Inspect the drive shaft about cracks broken welds, scored journal bearing, surfaces, or bent shaft.

Parts with any of these faults must be replaced.

Inspect the sleeve yoke for worn splines, worn bearing surfaces and bearings and plugged lubricant fittings.

Assembling

Assembling operation is a reversal of disassembly.

Install spider in yoke flange.

Insert the journal into the yoke flange. Tap the journal bearing into the yoke flange, using a brass drift smaller than the hole in the yoke. Tap the other bearing into the opposite end of the yoke flange until the bearing is in line with the snap ring grooves.

With a pair of pliers, install the snap rings on both ends of the yoke flange.

Insert the flange assembly in the sleeve yoke.

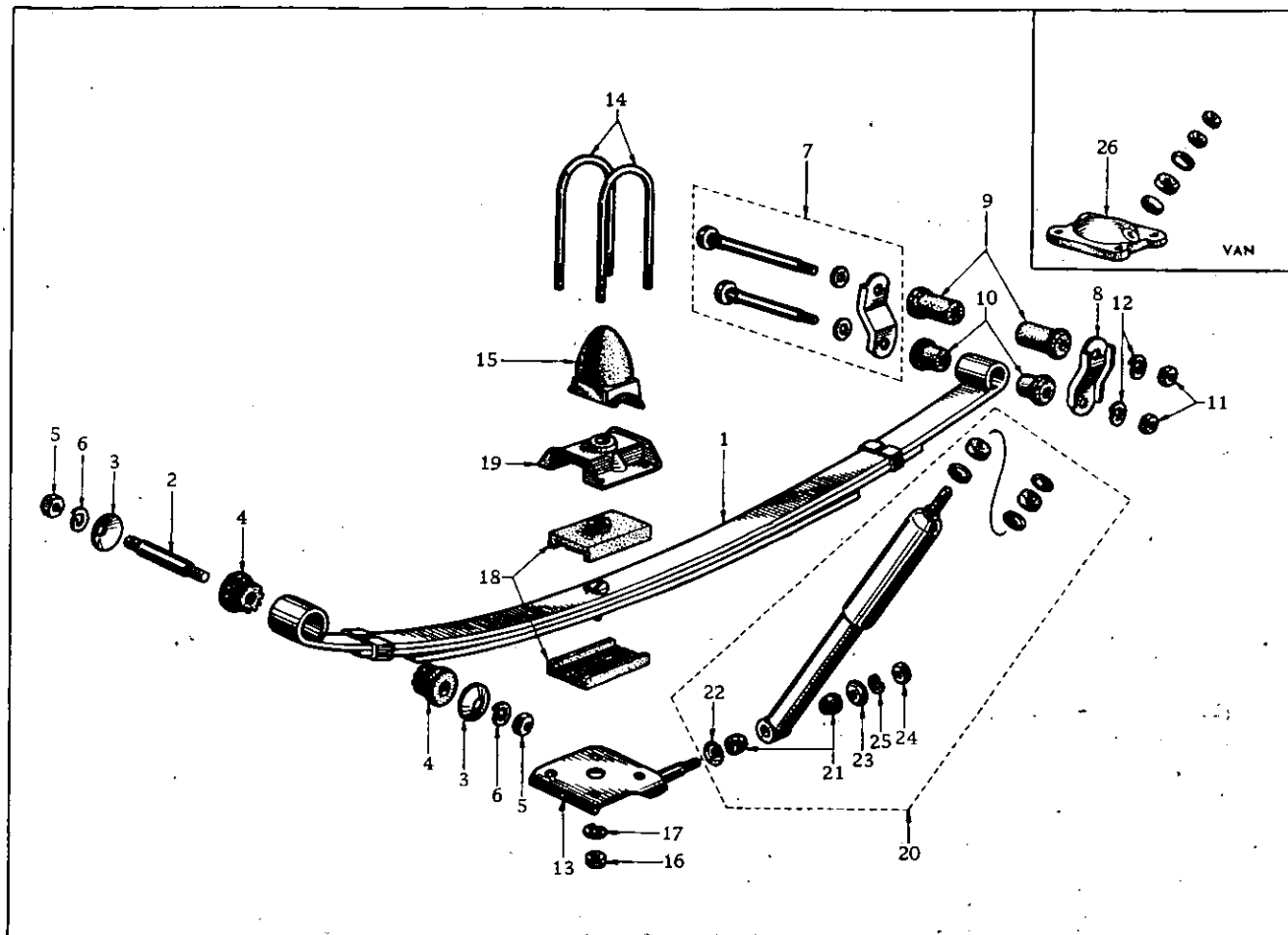
Place the other yoke bearing into the opposite end of the yoke, and tap this bearing into the yoke until the bearing is in line with the snap ring grooves. Install the snap rings on both ends of the yoke. After assembling all parts, make sure about tightness on the around spider.

In the case of excess clearance, adjust with over size snap rings as follows:

Snap Ring (Over Size)

Part No.	Thickness	Distinguished painted colour
37146 18000	1.46	White
37147 18000	1.48	Yellow
37148 18000	1.50	Red
37149 18000	1.52	Green
37150 18000	1.54	Blue
37151 18000	1.56	Brown
37152 18000	1.58	

REAR SUSPENSION

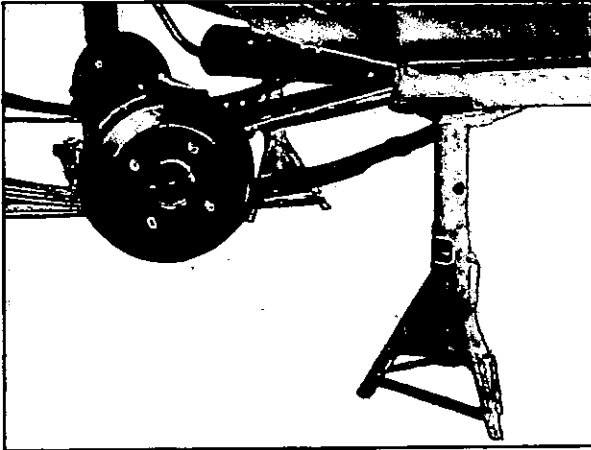


Constructure of Rear Suspension

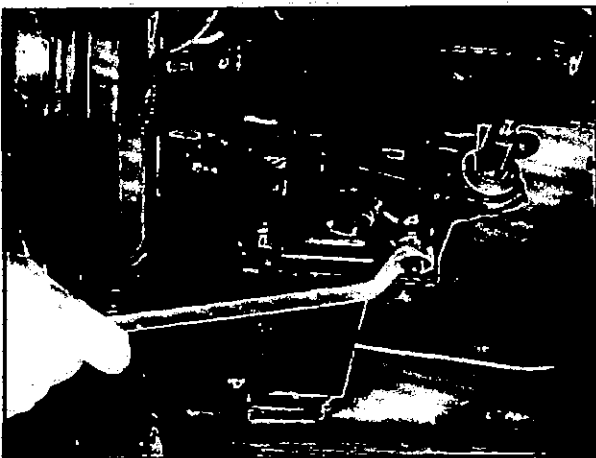
1	Ass'y-spring, rear	14	Clip-rear spring
2	Pin-rear spring front	15	Ass'y-bumper, rear axle
3	Cap-front bracket, rear spring	16	Nut
4	Bushing-rubber, rear spring	17	Washer-lock
5	Nut	18	Pad-seat, rear spring
6	Washer-lock	19	Plate-location, rear spring
7	Ass'y-shackle, rear spring	20	Kit-shock absorber, rear
8	Plate-shackle, rear spring inner	21	Bushing-rubber, rear shock
9	Bushing-rear spring rear upper	22	Washer-shock absorber
10	Bushing-rear spring rear lower	23	Washer-shock absorber
11	Nut	24	Nut
12	Washer-lock	25	Washer-lock
13	Seat-rear spring lower	26	Bracket-rear shock absorber

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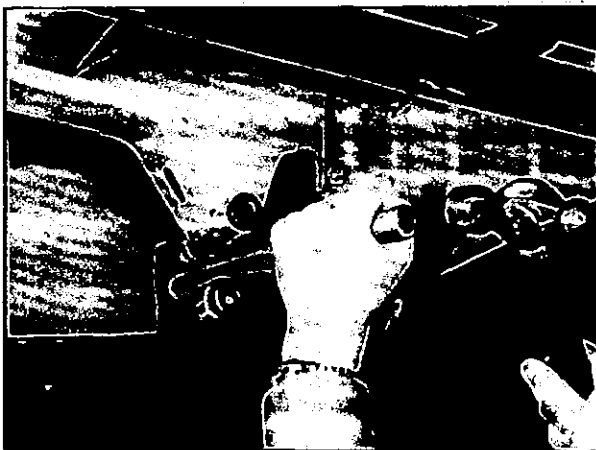
Disconnect From Body



Jack up the body and hold at the side member on the stand.

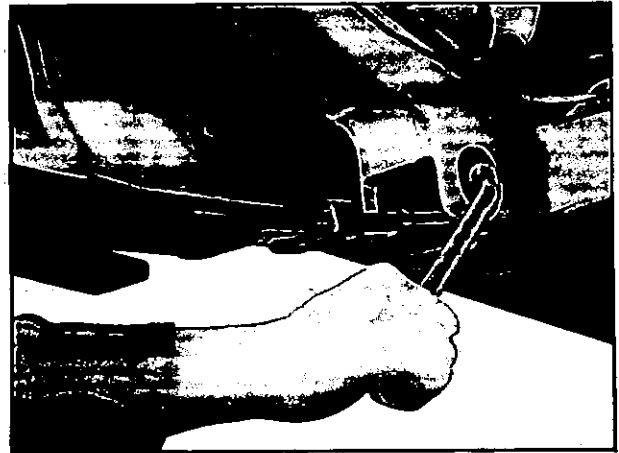


Take off the shock absorber from spring seat. Jack up the rear axle housing to release load. Disconnect bumper, U bolt, location plate, seat pad and spring seat etc.



Disconnect the shackle, rear spring front pin and then separate the rear spring as showing the figure.

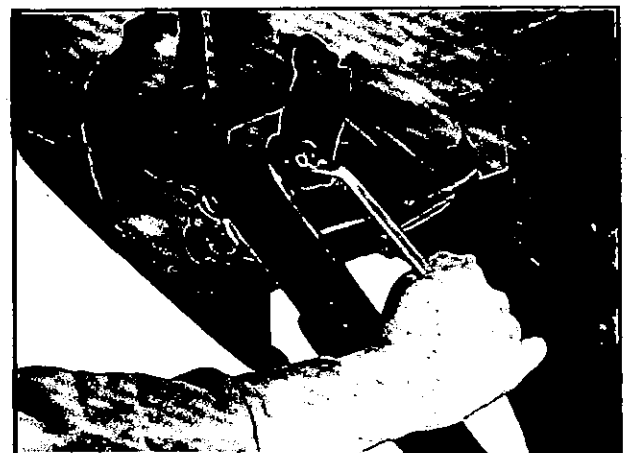
Fixing to the Side Member



Attach the bushing to the rear spring and rear spring bracket.

Connect the front side of rear spring to rear spring bracket.

Front pin
Tightening torque 3.5 ~ 4.0 kg-m



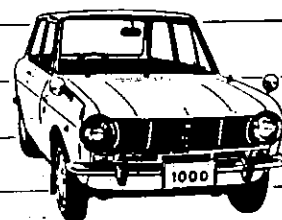
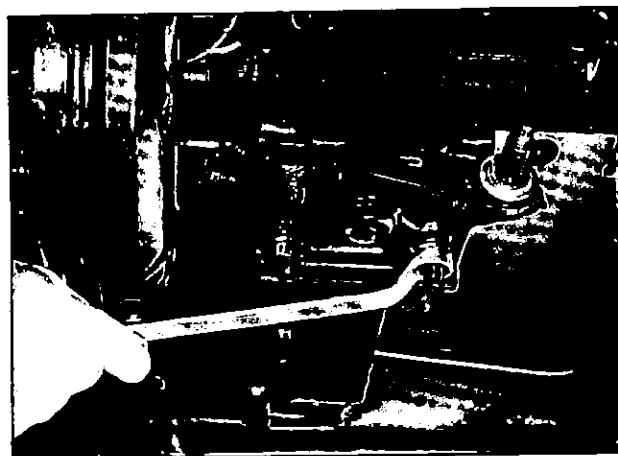
Connect the rear side of spring to the bracket.

Shackle pin
Tightening torque 2.0 ~ 2.5 kg-m

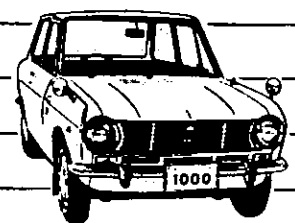
Set up the seat pad, location plate, rear axle bumper, U bolt, and spring seat.

U bolt

Tightening torque 3.5 ~ 4.0 kg-m

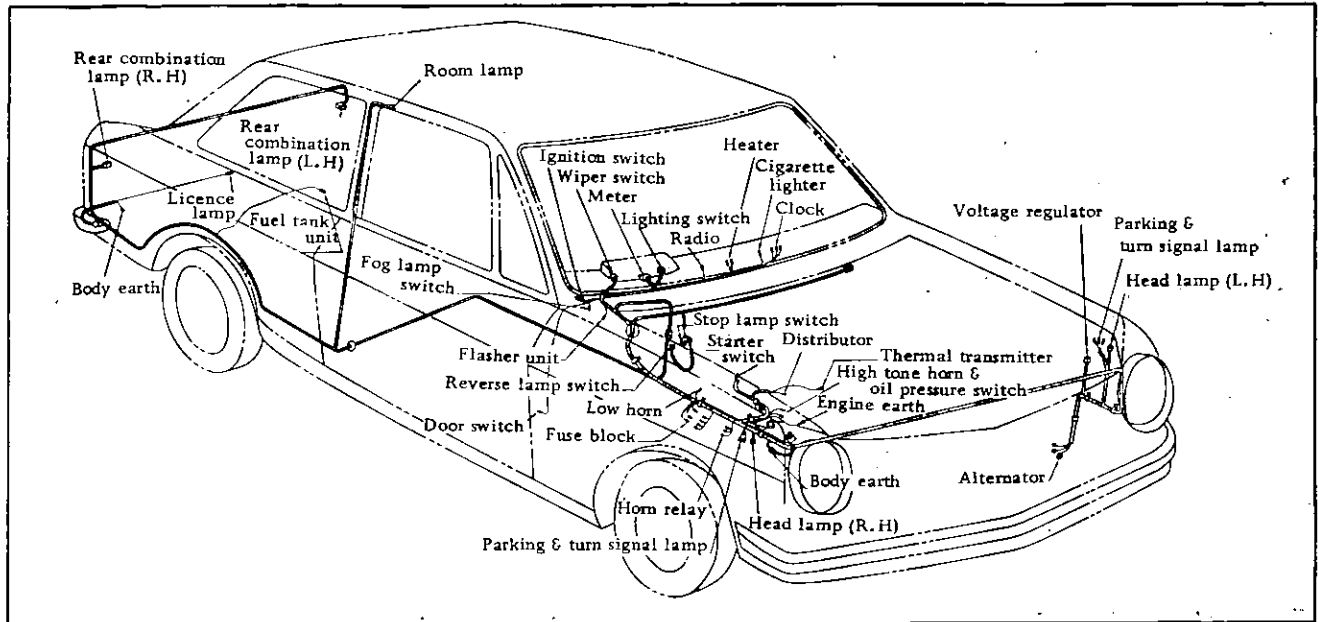


DATSUN 1000

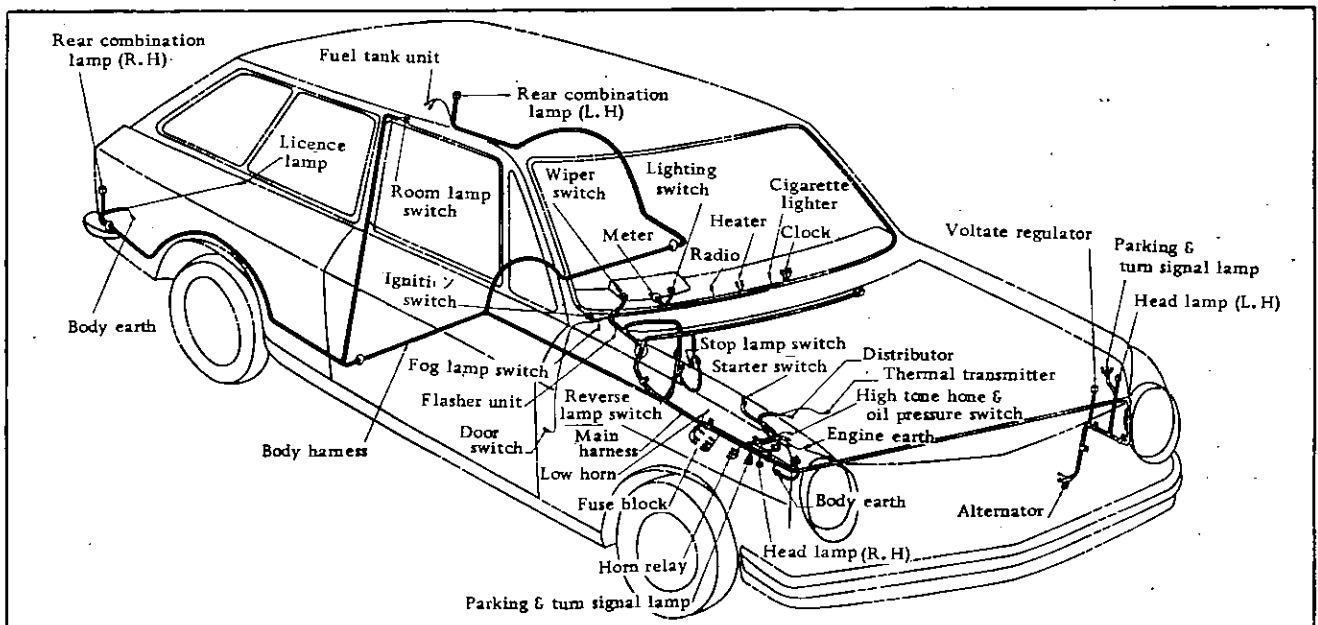


ELECTRICAL SYSTEM

Wiring Harness

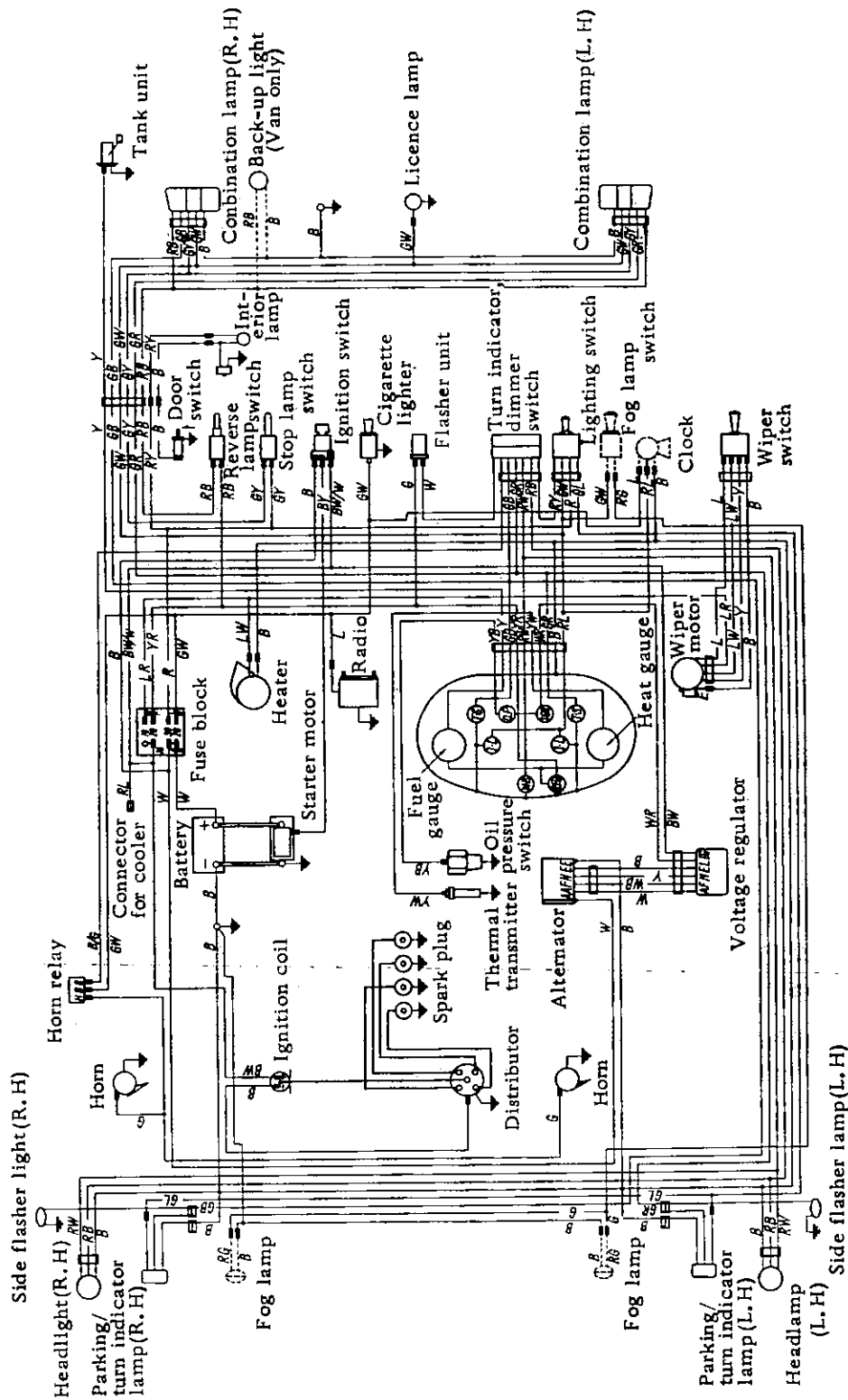


B10 Type Wiring Harness



VB10 Type Wiring Harness

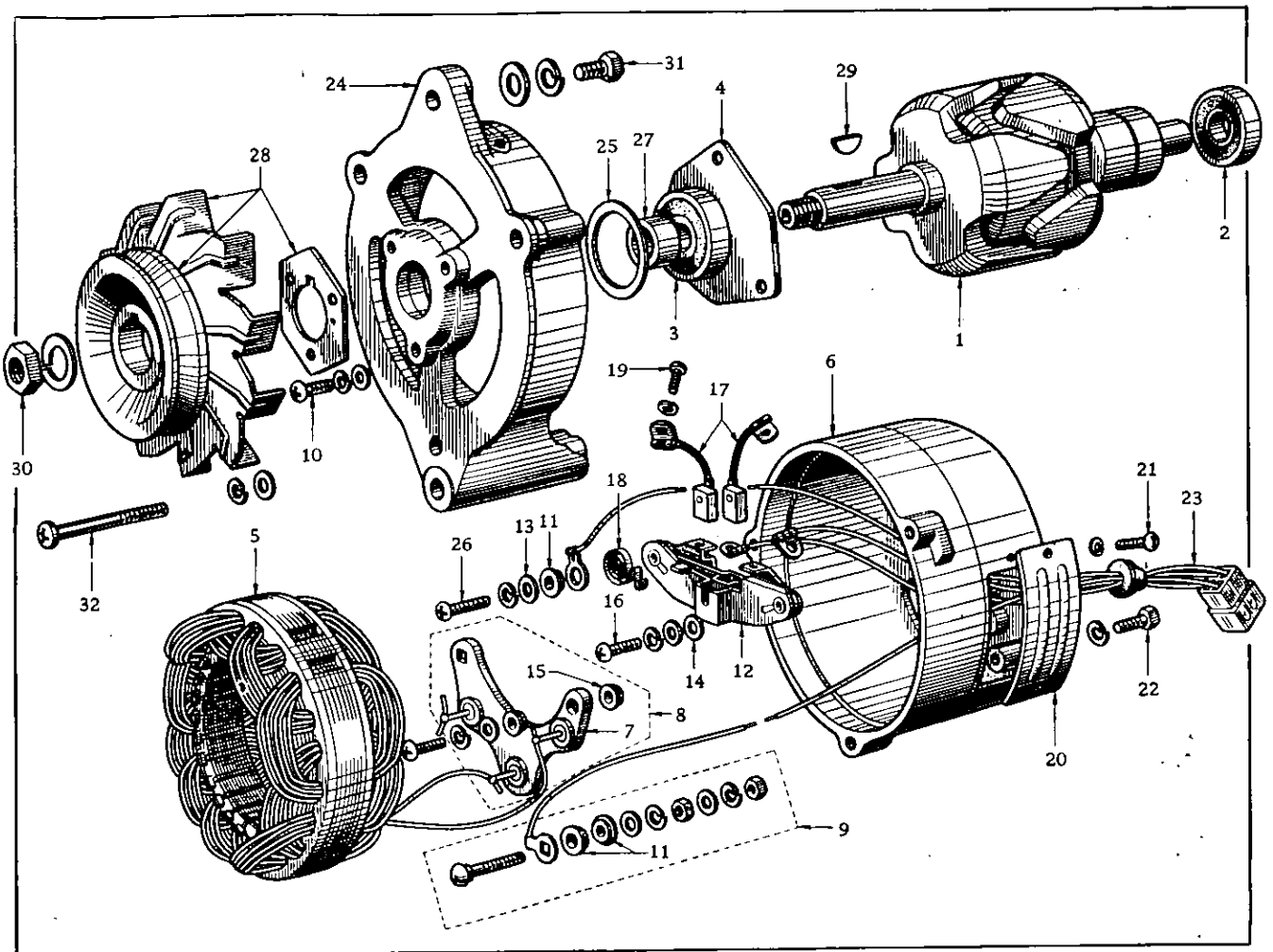
WIRING DIAGRAM



Wiring Colour

B ..	Black
W ..	White
R ..	Red
G ..	Green
Y ..	Yellow
L ..	Blue

①	Instrument light
②	Turn indicator pilot light
③	Ignition warning light
④	Oil pressure warning light
⑤	Main beam pilot light
⑥	Regulator



Alternator (Hitachi)

1	Ass'y-rotor	17	Brush
2	Bearing-ball	18	Spring-brush
3	Bearing-ball	19	Screw
4	Retainer-bearing	20	Cover-brush
5	Ass'y-stator	21	Screw
6	Ass'y-cover, rear	22	Bolt-terminal
7	Set-diode	23	Ass'y-wire, lead
8	Ass'y-diode set	24	Cover-front
9	Ass'y-terminal	25	Retainer-bearing
10	Screw	26	Screw
11	Bushing-insulator	27	Spacer
12	Holder-brush	28	Ass'y-pulley
13	Washer-insulator	29	Key
14	Washer-insulator	30	Nut-pulley
15	Bushing-insulating	31	Bolt-set
16	Screw	32	Bolt-through

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ALTERNATOR

Alternator Model	Hitachi LT125-02 AC300/12WR
Nominal output	12V-250W
Constant	Successive
Pole	- side ground
Constant revolution	2,500 r.p.m.
No load minimum revolution	1,000 r.p.m. down 14V (normal temp.)
Output current	2,500 r.p.m. 14V 24.5A up (normal temp.) 2,500 r.p.m. 14V 21.5A up (high temp.)
Regulator Type	TLIZ10A Tirrill type (leaf spring)
Element	Constant voltage relay Pilot lamp relay
Constant voltage relay	3 contact point type

	Primary side	Secondary side
Adjust, valve	14 ~ 15V	14 ~ 15V
Dynamo revolution	4,000 r.p.m.	4,000 r.p.m.
Load	Battery + resisting load 21.5A approx.	Battery

Note: Use battery charged in full.

Pilot lamp relay (3 contact point type)

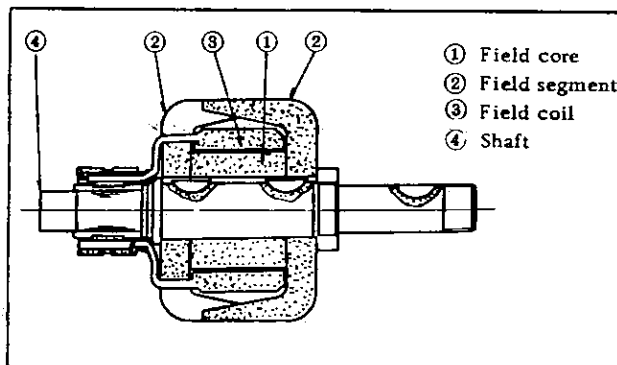
Put-off voltage	Put-on voltage
4.5 ~ 5.2V	0.5 ~ 3V

GENERATOR

Construction and Feature

Different from the DC generator, the AC generator turns the magnetic pole and fixes armature making it generates 3-phase alternate current, and rectifies all waves with the silicon diode, (+) (-) each three, that are built within, and takes out as direct current.

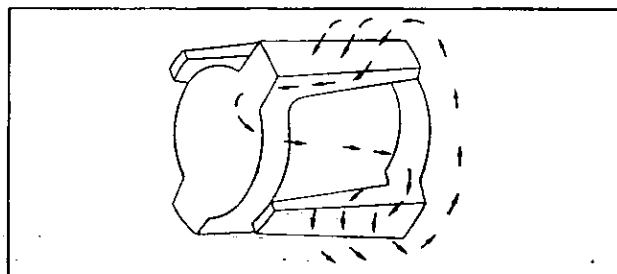
The sealed ball bearings are used to support the rotor. Clearance between the brush and brush holder is also made so as to prevent it from dust. Thus the AC generator will increase milage without maintenance. Each 3 diodes are pressed in the rear cover and the diode base respectively.



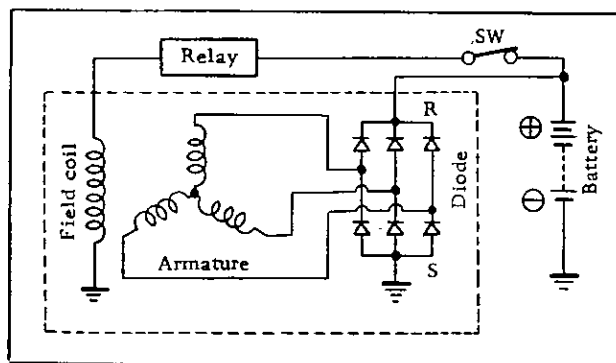
Sectional View of Rotor

The clip ring pressed in the shaft is soldered at both ends of the field coil to pass magnetic current.

The pole of rotor makes out the magnetic circuit as shown in Figure and all the poles are magnetized by doughnut coil.



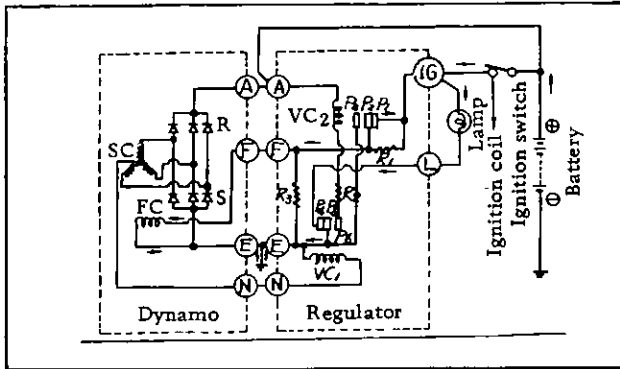
Magnetic Circuit



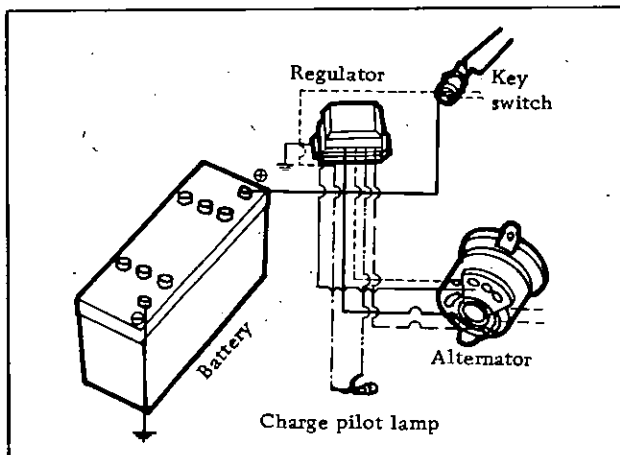
Connection within Dynamo

ELECTRICAL SYSTEM

The armature is of a three phase Y connection type and the silicon diode rectifies all waves. It pulls out the neutral point and adds voltage having conducted 3 phase half wave rectification in the circuit of relay and controls the voltage coil of the pilot lamp relay.



Charging System



Outside Connection

When the ignition switch is put on, the battery current flows in the arrow marked direction passing through the dynamo E terminal, brush slip ring, field coil, slip ring, brush, dynamo F terminal, relay F terminal and IG terminal and completes the field circuit. It is difficult for the dynamo to stand up only by residual magnetism of the field core, so that magnetization is necessary until voltage rises to suit charging after the engine has started.

This is because the diode is used and when the voltage to add to it is so low, large proportional resistance shows up and current does not

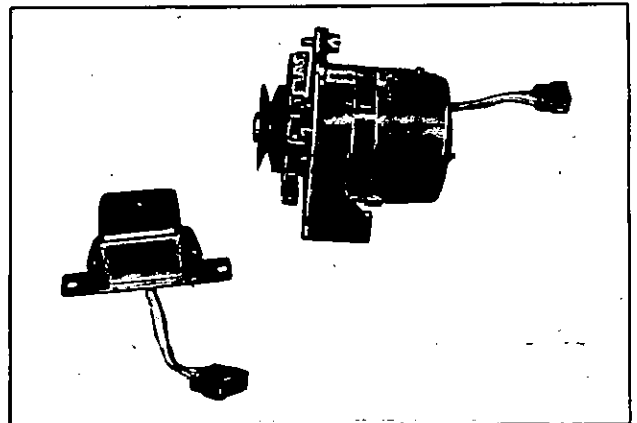
flow through the field coil unless the dynamo makes very high revolution.

Disassembly and Assembly

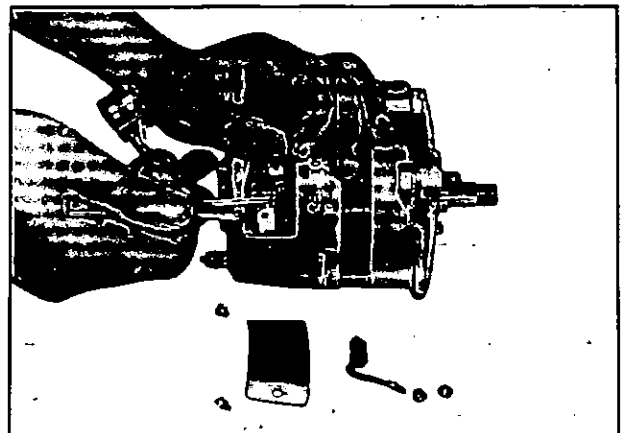
A. Disassembly

The dynamo is disassembled in the following order.

a)

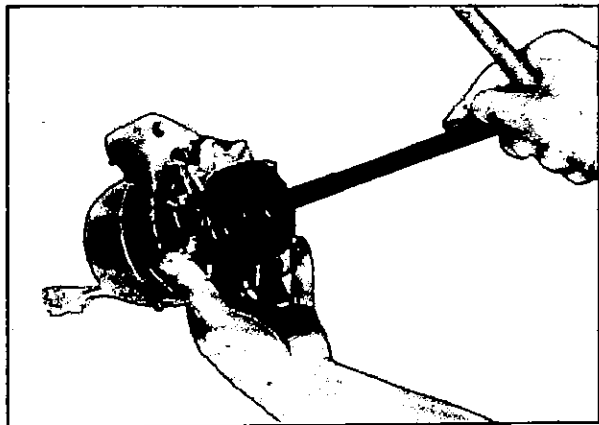


b) Remove the brush cover and pull off the brush, 2 ea.

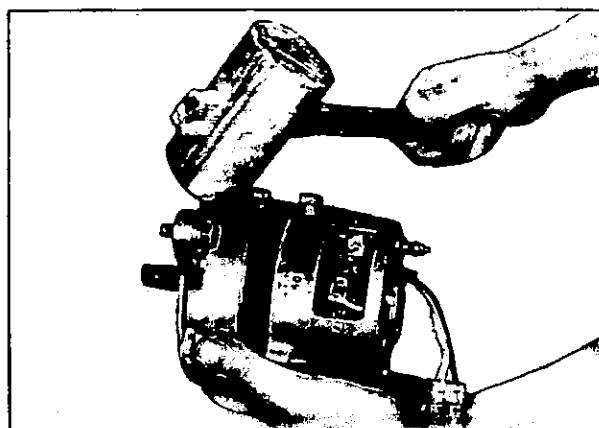
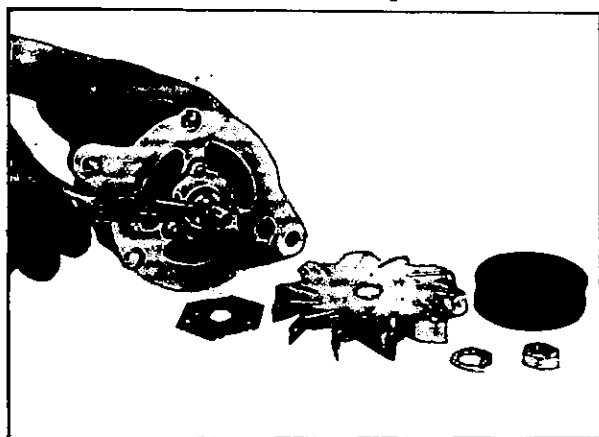


c) Remove the cover of bearing and take off the hex. bolt of shaft.

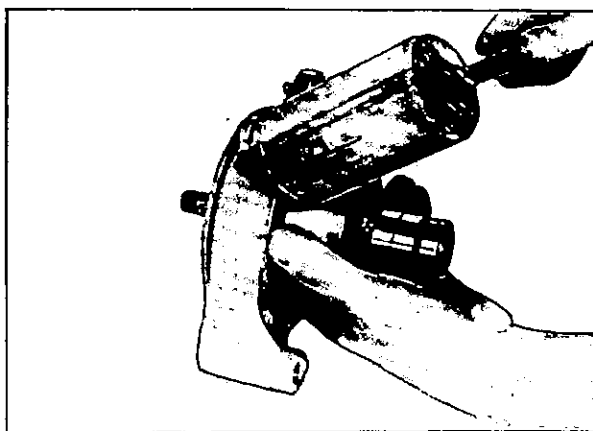
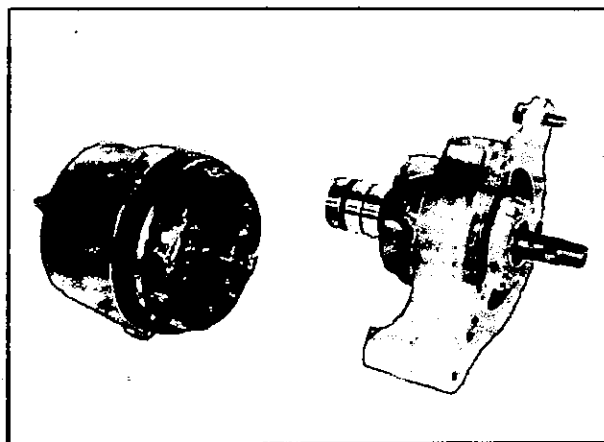
DATSUN 1000



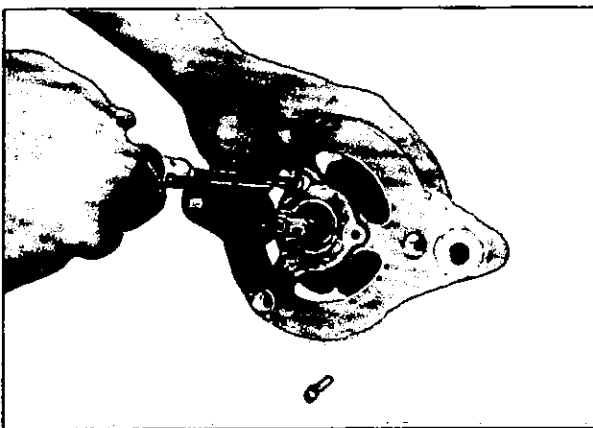
- d) Remove the hex. nut of pulley and pull off the pulley and the half-moon key. Be careful not to injure the fan when the nut is removed.



- e) Remove the through bolt tightening bolt front cover and rear cover, pull off the front cover and rotor. Use a hammer of wood or plastic if necessary.



- f)

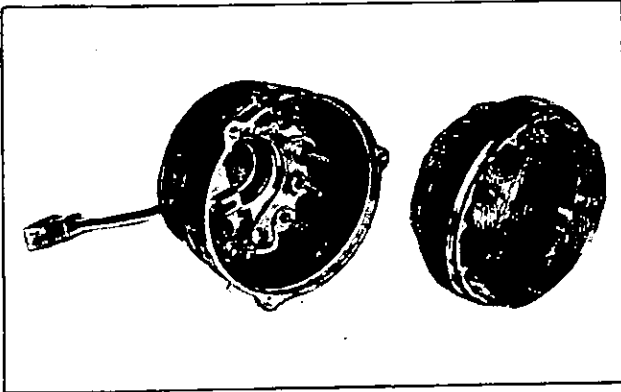


ELECTRICAL SYSTEM

Remove the ball bearing from the front cover. Remove the bolt or tightening the bearing plate and or pull off the bearing with such as hand press.

Slacken N terminal bolt on the rear cover side and remove the clip terminal, then the rear cover and the stator can be separated.

g)



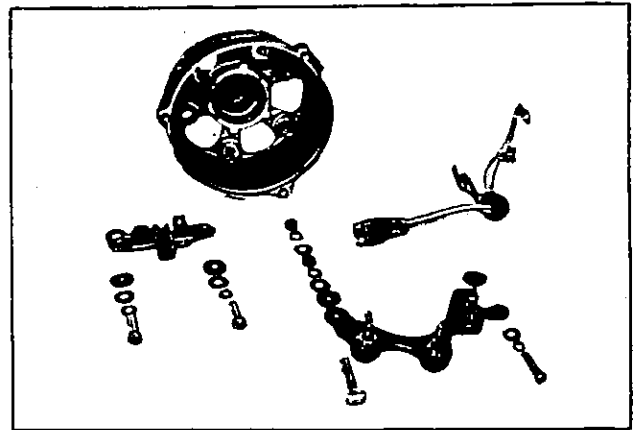
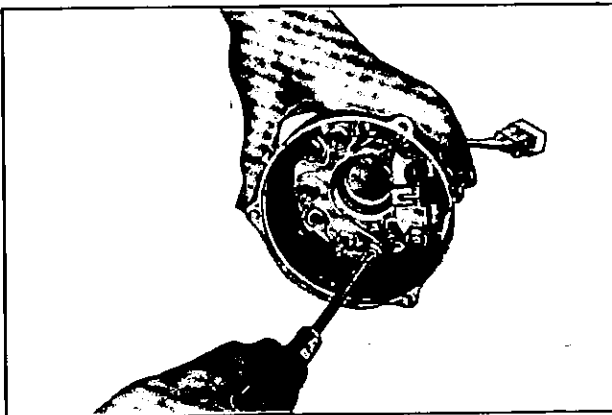
Remove the rear cover and stator.

Separate the silicon diode, 3 ea. from the stator coil lead wire, 3 ea. by melting soldering with an electric iron.

Slacken N terminal bolt on the rear cover side and remove the clip terminal, then the rear cover and the stator can be separated.

NOTE: When temperature within diode gear up over 150°C the diode will lose functioning, so that use the electric iron, 100 ~ 200W, for around 2 seconds at the soldered portions.

h)



Remove the diode set and brush holder from the rear cover.

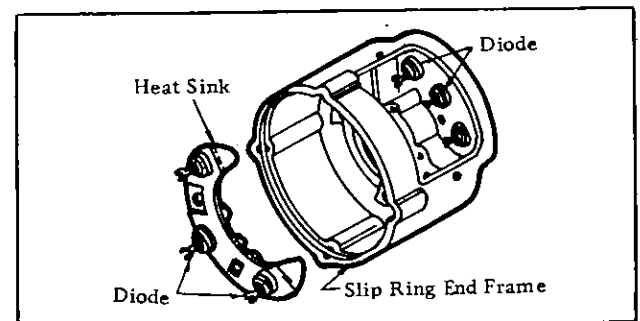
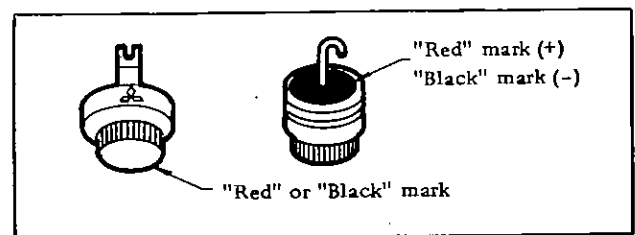
When be careful not to lose small parts such as screws, washers and bushings.

B. Assembly

Assembly is done in the reverse sequence of disassembly.

Always make sure the polarity of alternator or regulator before replacing the diode either positive or negative. The polarity of alternator or regulator is usually marked on the nameplate or label which is attached to each model.

In case the alternator or regulator shows the positive ground, the red coloured diode should be mounted in the frame of slip ring end and the black coloured diode in the heat sink.

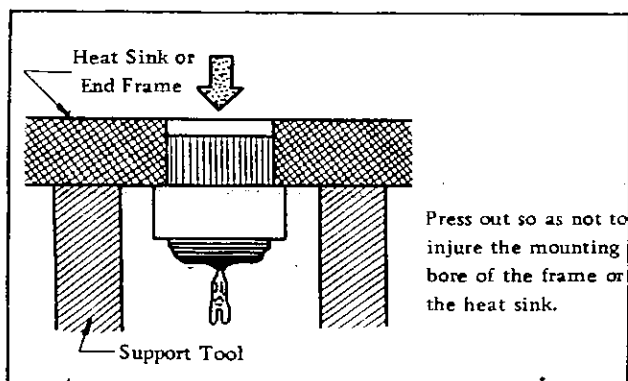


Exploded View

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Removal

To remove a diode, use a suitable tool to support the end of the frame, or heat sink, and push the diode out by using an arbor press as shown the below.

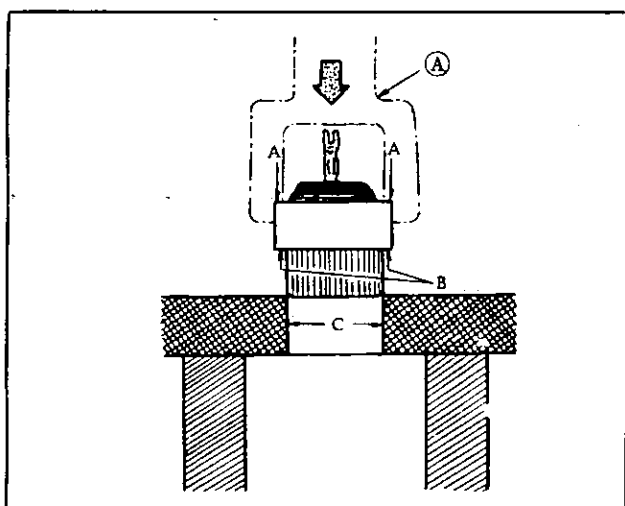


Installation

Support the heat sink or end frame with a suitable tool and then press the diode in the heat sink and end frame by using the tool shaped (A) which fits over the outer diode edge A portion.

Press down perfectly the diode in the mounting bore of C portion to the lower edge of B portion of the diode.

Checking the replaced diodes.



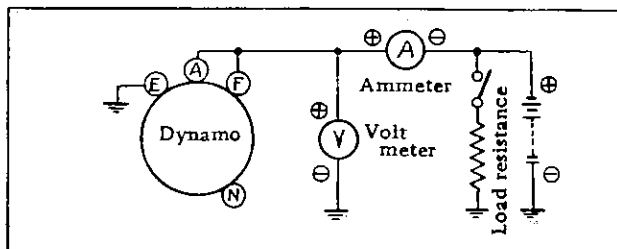
Inspection of Troubles

A. Inspection of Output

For inspection of output, remove the dynamo from the vehicle and connect wiring as shown in

Figure and drive it with motor.

(For inspection of output of dynamo without removing it from the vehicle, refer to "Inspection of AC Generator" to be published later.)



NOTE: Use the battery charged in full up to the normal capacity.

Through the wiring shown in Figure, magnetic current flows from the battery to the field coil of dynamo. In this state, raise revolution of dynamo slowly up to the speed where there is no reverse flow (2 A approx.) to the field coil and read the revolution. Correct revolution is approx. 1000 rpm. without load.

Next, increase load resistance to the maximum and almost stop flowing of load current, and put off the switch. Then, raising the load current slowly, increase revolution of dynamo. Observe thus oncreasing output current as revolution of dynamo increases. If there is no large difference from the specification, it is correct.

No matter how the battery is over-charged or discharged, if the charging current is small, first make sure either the dynamo or the relay is in disorder. See the charging current by inserting the ammeter between A terminal of relay and the battery.

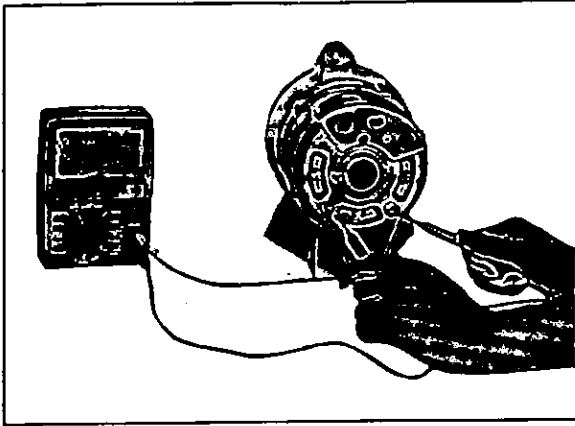
Disconnect wire passing from the dynamo F terminal to the relay F terminal at the relay F terminal and make the removed lead wire short circuits at the relay A terminal, when if the charging current highly increases, the relay is in disorder.

B. Short Circuits on Diode "-" Side

It can be judged as the pilot lamp does not flare even if the key switch is turned on. Actually a trouble such as "diode open" is very rare and short circuits at the polar line are also rare. Ordinarily, there are many cases of "+" side short circuits.

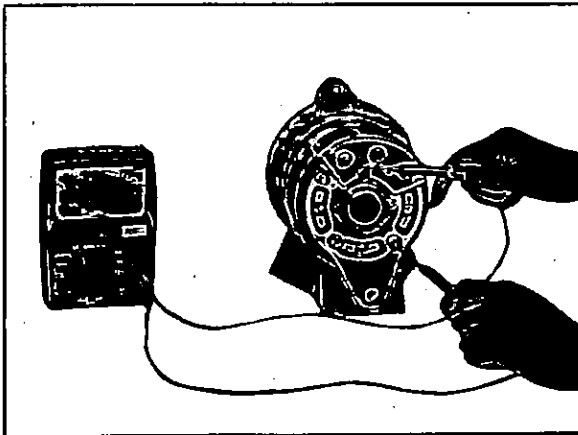
C. Inspection of Diode with Tester

a) Simple Inspection



Check between the terminals, A-N as shown in Figure. Set the dial of tester for conductivity and put the tester needles at both terminals alternately.

When one shows low resistance and the other shows pretty high resistance, the 3 diodes in the diode set are all right.



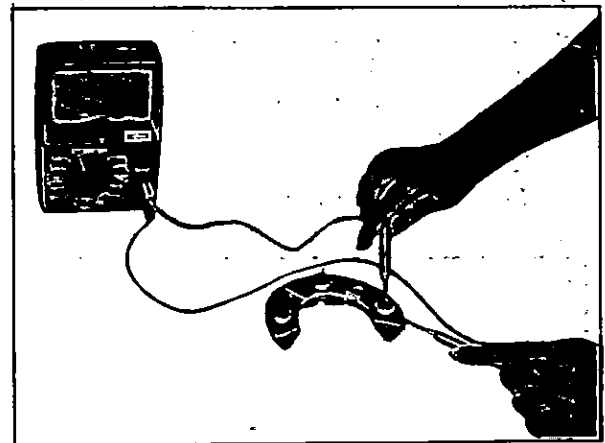
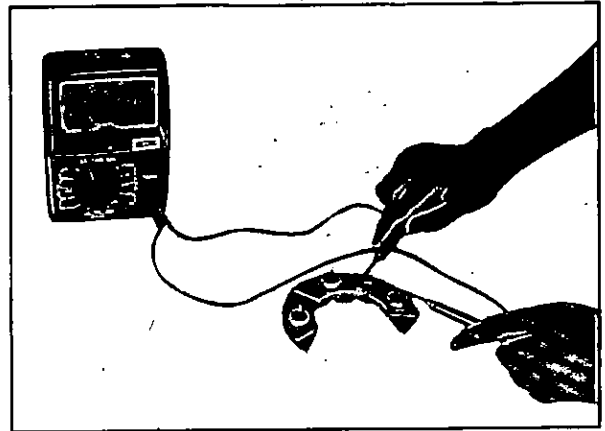
Check between the terminals, A-E same as above.

When the same result is obtained, 3 diodes are also all right.

However, when there is no disorder found in this simple test and the dynamo output is

somewhat lower than the standard, 1~2 diodes are often in opening, when one by one checking will be necessary.

b) Separate Inspection



Check resistance with the tester between the diode base commonly used for 2 diodes and lead wire on the rear cover -2 times charging the poles

When one side shows low resistance and the other shows high resistance, there is no disorder. If both sides are low, there will be short circuit and both sides are high there will be open.

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D. Inspection of Diode with Lamp

a) Simple Inspection

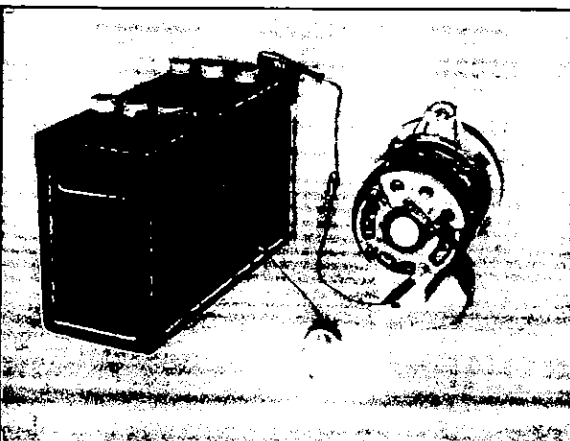
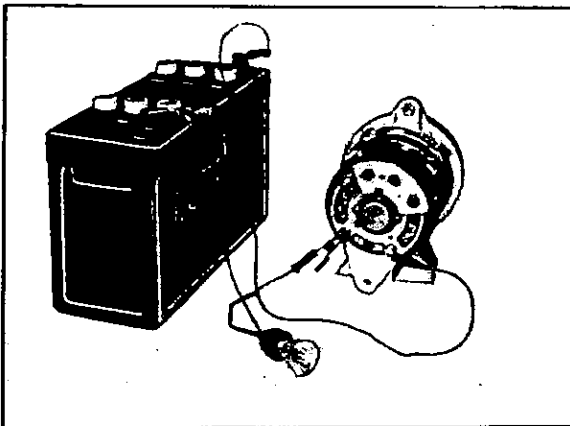
Check positive diodes

Test Method	Test	Lamp	Method
	Connection	Lamp	Result
Should be conductive Ⓐ to Ⓑ	Connect ⊕ to Ⓐ and ⊖ to Ⓑ	Light	Good
		No Light	Defective
Should be non-conductive Ⓑ to Ⓐ	Connect ⊖ to Ⓐ and ⊕ to Ⓑ	No Light	Good
		Light	Defective

Check negative diodes

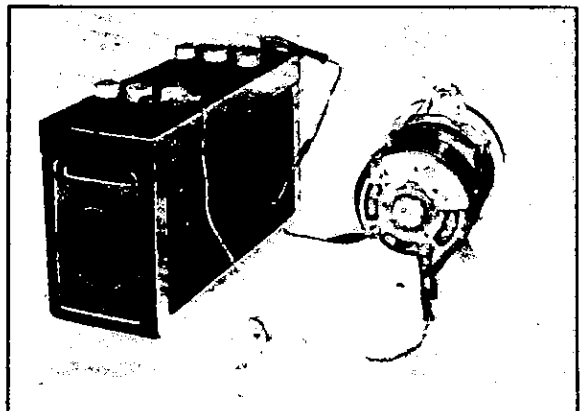
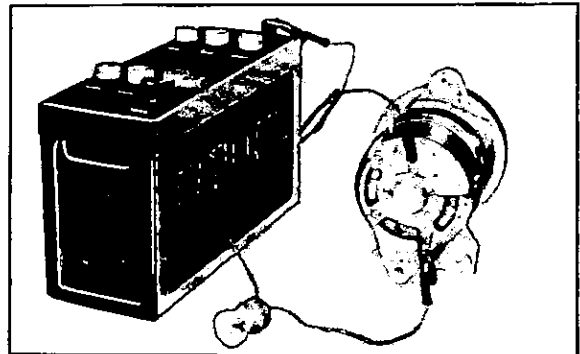
Test Method	Test	Lamp	Method
	Connection	Lamp	Result
Should be non-conductive Ⓐ to Ⓑ	Connect ⊖ to Ⓐ and to Ⓑ	Light	Good
		No Light	Defective
Should be conductive Ⓑ to Ⓐ	Connect ⊖ to Ⓑ and ⊕ to Ⓐ	Light	Defective
		No Light	Good

The soldering for the lead wires should be performed in less than 20 seconds, as the excessive heat may damage the diodes.



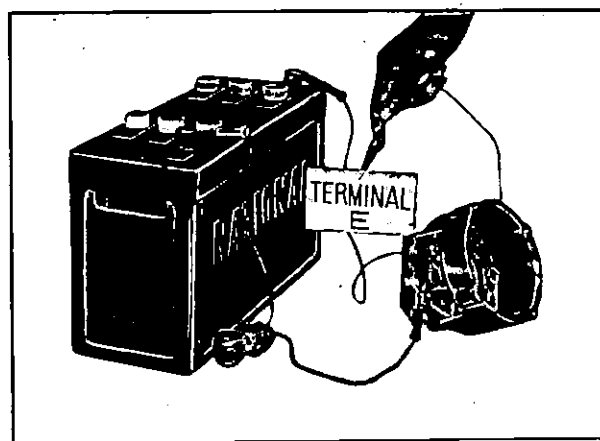
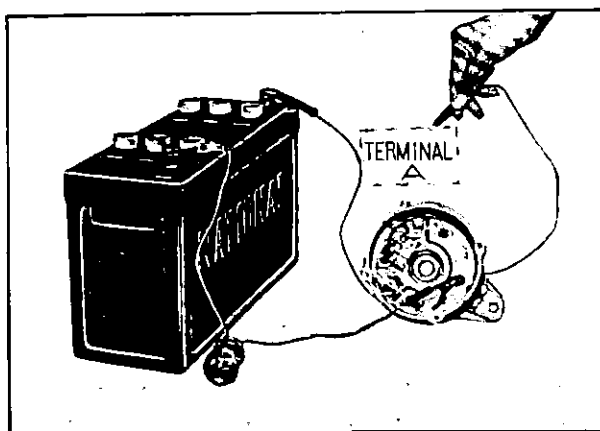
Check between the terminals, A-N as shown in Figure.

Connect with the lamp (12V) in straight and put both ends at A and N terminals alternately. On one side the lamp flares and on the other the lamp is off, when 3 diodes of the diode set are all right.



The same step is taken between the terminals, N-E. When the same result is obtained, 3 diodes pressed in the cover are all right. However, if the simple test is all right, but when the dynamo output is lower than the standard, 1 ~ 2 diodes may often be opening, so that one by one check will be necessary.

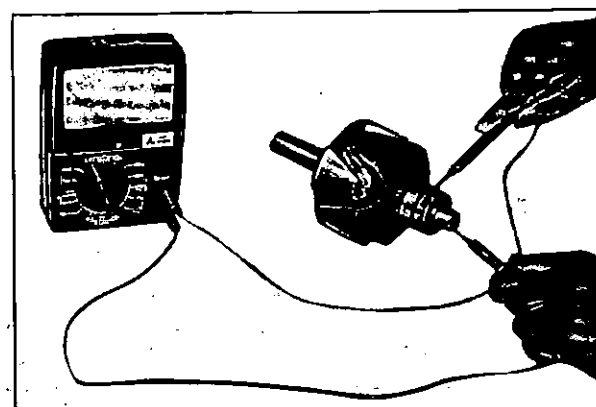
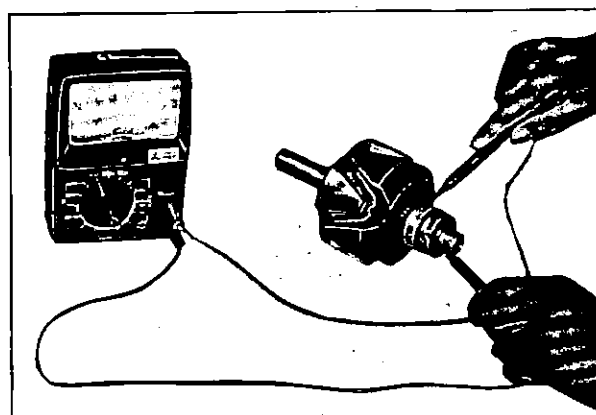
b) Separate Inspection



Check between the lead wire and the diode set common with the other 2 diodes or the rear cover with the lamp and battery. It is all right if one side flares and the other is off. If both sides flare, there is short circuit and both sides are off, there is open.

E. Inspection Field Coil

As shown in Figure, put the tester between the slip ring of rotor and if there are 6 ~ 7 Ω , it is all right. Make sure there is no conduction between the rotor slip ring and the shaft.



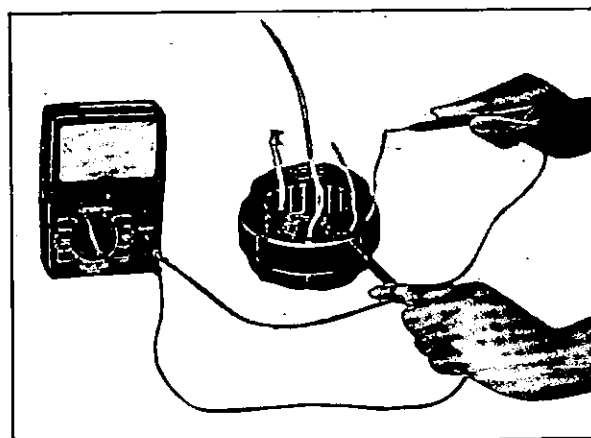
F. Ball Bearing

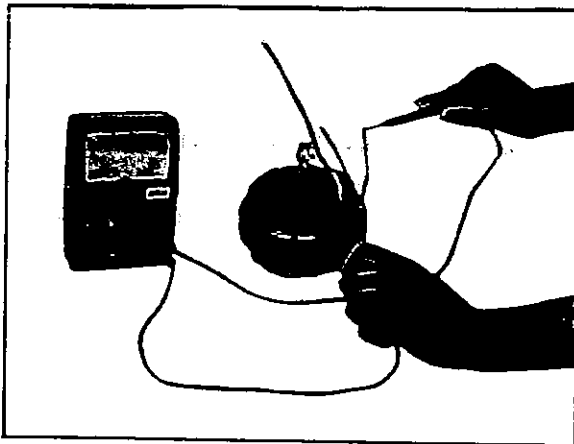
Both sides sealed ball bearing is used, so lubrication is not necessary.

G. Inspection of Stator (Armature)

a) Conduction Test

If the terminal connected to the diode is not conductive with the stator core, that is all right.

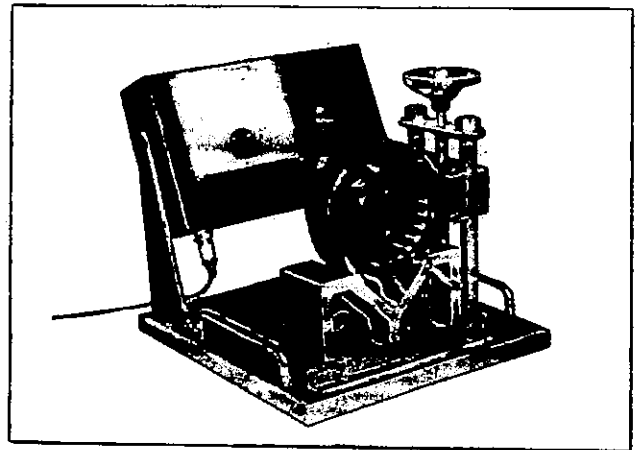




If each terminal of the coil and the terminal connected to N terminal are not conductive, that is all right.

b) Layer Test

Connect the tester cord to 100V wire, put the stator on the test stand and make the tester one turn reading the ammeter. If there is short circuit on the coil, swings of the ammeter abruptly increase and if there is no trouble, there will be no change.



H. Inspection of Brush

Wipe with clean cloth when oil or dust is on the contact surface of the brush and slip ring.

Same as in case of DC generator, replace the brush when wear of it reached to the wear limit.



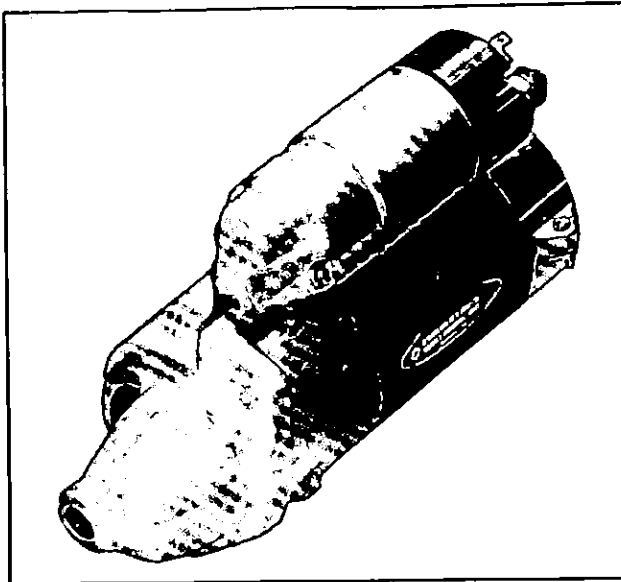
14 ITEMS ON HANDLING

PROHIBITION	REASON
<p>(1) When mounting on vehicle, polish the contact points on both sides removing point, rust or oil.</p> <p>(2) Make sure the engine side pitch and dynamo side pitch of the front cover are well fitted together.</p> <p>(3) Be attentive to the belt tension.</p> <p>(4) Regulator is sealed with lead. If the seal is removed during the claim period, the claim will invalid.</p> <p>(5) If the earth is not correctly set, the adjust value will change.</p> <p>(6) Connect the dynamo and battery with full attention.</p> <p>(7) Make sure the whole circuit is completely composed.</p> <p>(8) Change wiring with full attention.</p>	<p>When the battery poles are connected in reverse, large current flows from battery to dynamo, resulting in damages of diode or lead wire.</p>
<p>(9) Do not use the high voltage tester such as megger.</p>	<p>When after the engine started the dynamo is magnetized from the ignition switch, so that incorrect wiring will result in hampering magnetization and then generation.</p>
<p>(10) Engine room must be kept in the condition of standard usage.</p>	<p>As diode is built in, the diode will be damaged with high voltage.</p>
<p>(11) Do not separate the battery terminal (dynamo terminal) during driving vehicle.</p>	<p>Because there is diode which will deteriorate or be damaged with temperature higher than the normal.</p>
<p>(12) When cleaning with steam cleaner, do not expose dynamo to steam directly. When washing with water, dynamo must be free from reckless pour of water.</p>	<p>Separation of the terminal causes surge voltage within battery and damages diode.</p>
<p>(13) When the battery is quickly charged with the quick charger, the lead wire or regulator A terminal (dynamo A terminal) should be disconnected.</p>	<p>If the diode is moistened, the performance will be lowered.</p>
<p>(14) Put the key switch off when the engine in a stop except when particularly needed.</p>	<p>Surge voltage of the quick charger will also damage diode.</p> <p>When the key switch is on, magnetic current always flows on the field coil and might damage the dynamo and often causes over discharge of battery.</p>

TROUBLE SHOOTING LIST

TROUBLE & CAUSE	REMEDY
<p><i>1 Over-discharge of battery</i></p> <ol style="list-style-type: none"> 1. Slackness of fan belt 2. Earth or breakage of stator coil 3. Breakage of rotor coil 4. Mal-contact of brush and slip ring 5. Mal-function of diode 6. Adjust voltage of constant voltage relay is low. 7. Mal-contact of low speed side contact point of constant voltage relay. 8. Adherence of high speed side contact point. 9. Shortage or unfitness of electrolyte. 10. Mal-function of battery pole. (short circuit) 11. Mal-contact of battery terminal. 12. Mal-contact or breakage between ignition switch and relay IG terminal. 13. Mal-contact or breakage between regulator F terminal and dynamo F terminal. 14. Excessive electric load. <p><i>2 Over-charge of battery</i></p> <ol style="list-style-type: none"> 1. Constant voltage relay adjust voltage is too high. 2. Constant voltage relay coil breakage or rare short. 3. Constant voltage relay coil straight resistance breakage. 4. Constant voltage relay low speed side contact point adherence. 5. Constant voltage relay high speed side contact point mal-contact. 6. Breakage or rare short of pilot lamp relay. 7. Mal-contact of pilot lamp relay contact point. 8. Mal-function of regulator earth. 9. Mal-contact or breakage between regulator N terminal and dynamo N terminal. <p><i>3 Noises of dynamo</i></p> <ol style="list-style-type: none"> 1. Mal-function of bearing. 2. Mal-function of diode. 3. Earth or rare short of stator coil. 	<p>Adjust Repair or replace Replace Replace brush, clean holder Replace as a set Readjust</p> <p>Polish contact point Replace Add distilled water, check S.G. Replace or repair Clean, retighten terminal</p> <p>Repair</p> <p>Repair Check power consumed</p> <p>Readjust</p> <p>Replace</p> <p>Replace</p> <p>Replace</p> <p>Polish contact point Replace Polish contact point Adjust</p> <p>Repair</p> <p>Replace Replace diode as a set Replace</p>

STARTER MOTOR



Type S114-87 Starting Motor (Hitachi)

Type		S114-87
Rated output	V-Kw	12 - 1.0
Meshing device		Magnetic
No load current	V-A	Under 12-60
No load rev.	rpm	Above 7,000
Brush normal height	mm	16
Brush wear limit	mm	9.5
Brush spring tension	gram	800 \pm 15 %
Commutator	Dia. mm	33
Commutator wear limit	dia. mm	Under -2
Pinion operating voltage	V	Under 8

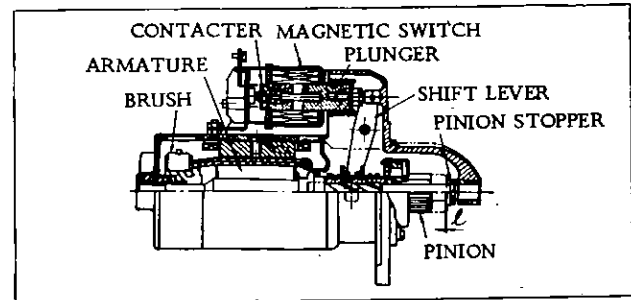
Construction and Operation

The starter motor is a 1.0 horsepower sliding inertia type electric motor for use in starting. The motor when mounted on the engine is on the front right side of the transmission with its pinion gear directly to the ring gear. The construction of the starter motor is similar to that of the generator but differs only in that its armature shaft extends out backwards with a pinion group installed on the end as shown in Figure.

The connection diagram for the starter is shown in Figure.

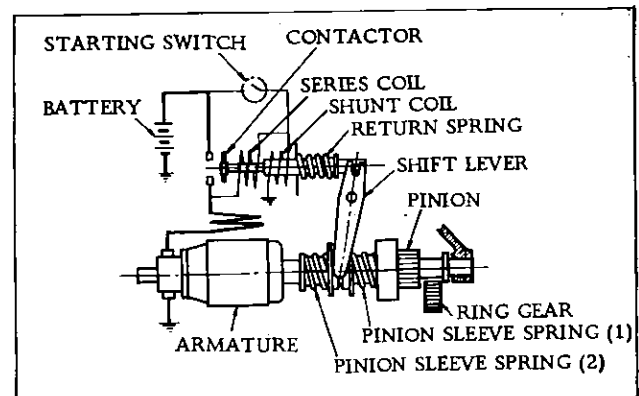
The starter switch is a key type combined with the ignition switch. By turning switch to the right direction, the relay on the magnetic

switch move to permit current to flow to the starter and cause the armature to start turning suddenly.



Magnetic Shift Type

After advancing about 14 mm, the pinion completes the meshing into the ring gear and drives it with a powerful torque. The direction in which the pinion moves is from the end of the shaft towards the starter bracket, thus reducing the bending torque. After the engine starts and its speed becomes greater than the no-load speed of the starter, the pinion is kicked back to unmesh and return to its former position.



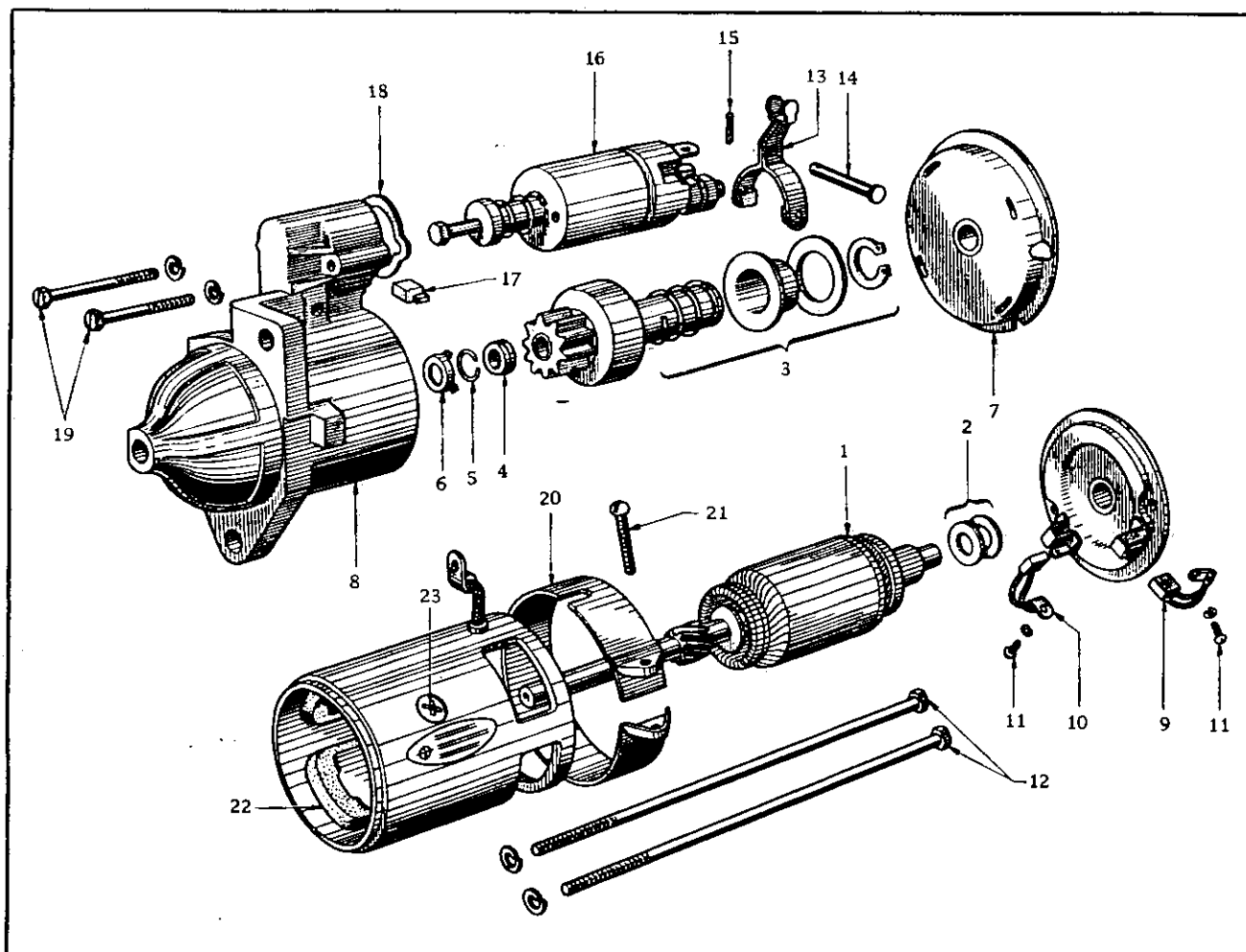
A View of Starter System

Operational Precautions

The instructions to be observed when starting the engine are as follows:

- (1) The starter should be securely mounted on the engine and should not show any looseness.
- (2) The starter switch should be operated properly and should be release immediately when the engine starts.

Expecting in extremely cold weather, the engine should normally start within 10 seconds.



Starter Motor (Hitachi)

1	Ass'y-armature	13	Lever-shift
2	Washer-thrust	14	Pin-lever
3	Ass'y-pinion	15	Pin-cotter
4	Stopper-pinion	16	Ass'y-switch, magnetic
5	Clip-stopper	17	Cover-dust
6	Washer-stopper	18	Packing
7	Bearing-center	19	Bolt
8	Ass'y-cover, rear	20	Ass'y-cover, brush
9	Brush (+)	21	Screw
10	Brush (-)	22	Ass'y-coil, field
11	Screw 3φ	23	Screw
12	Bolt-through		

ELECTRICAL SYSTEM

- (3) The starter switch should not be operated when the engine is running. If the engine fails to start, allow time for the pinion to come to rest before turning the starter switch again.
- (4) When the engine fails to start after turning the starter key for over 10 seconds, do not continue turning the key time after time but try to save the battery. In this case, check for the cause of the trouble and correct so that the engine will start.
- (2) The two stay bolts on the starter rear cover (front end when mounted on the engine) are removed.
- (3) After removing the band cover, the brushes and lead wires are removed.
- (4) By properly protecting and holding the starter body, the armature shaft is pulled out.
- (5) The armature and the front cover are taken out together.
- (6) To remove the pinion group from the armature shaft, the cotter pin on the end of the shaft is pulled out and by removing the pinion nut, the pinion group is removed.

Checking while in Operation

- (1) With a fully charged battery and with the lamps lighted, the starter switch is used. If the lamps become dim, especially when the engine does not start, the current is flowing through the starter motor coil but for some reason the armature is not turning. Careful check should be made since the starter pinion may be locked in the flywheel ring gear and unable to return, a trouble usually caused by turning on the starter while the engine is still running.
- (2) When the starter switch is turned up and the starter motor fails to turn although the lights remain bright, the switch should first be checked. If the switch is in satisfactory condition, then the condition of all the terminal and ground connections of the battery, starter switch and starter are checked. If the starter motor runs but its movement is sluggish, it indicates either a high resistance due to loose connection in the starter circuit or a badly discharged battery.
- (3) If after the above troubles are corrected and the starter fails to operate occasionally and shows defective performance, it is due to internal defects so that in this case, it should be dismantled and checked.

Dismantling and Disassembling

- (1) The starter can be dismantled easily by removing the two stud nuts mounting the starter on the engine.

Inspection and Repairing Parts

The same procedure as that for the generator parts is followed, the parts being cleaned and inspected after which determinations are made as to whether they can be reused or if repairs or replacements are necessary.

- (1) The pinion is inspected for defects and if the tooth face is worn or the tooth edge is damaged, the pinion should be replaced. Worn or broken teeth will not only make the gear mesh poorly but will hasten the wear on the opposing gear and also, poorly meshing gears will cause bending in the armature shaft. For this last reason, care should be taken, when inspecting, to also check the flywheel and take remedial measures if the ring gear is found worn or damaged. When the pinion is found defective, replaced the entire pinion group.
- (2) When inspecting the armature, check the armature to core gap, shaft to bushing clearance, bending in shaft, etc., in the same manner as that for the generator and are corrected to the specified limits, or the armature is replaced. Special attention should be given to the clearance between the armature and the core to see that they are not contacting, and corrosion found on the outside surface of the armature or the inner surface of the core should be removed by polishing, and the surfaces painted with rust preventive oil.

DATSUN 1000

- (3) The armature is inspected and repaired in accordance with the procedures outlined for the generator. Especially to improve or correct the brush contacting condition, the brushes are resealed. At the same time, the brush spring are checked and are corrected or replaced.
- (4) The insulation on the wires are carefully inspected and wires found with weak or damaged insulation should be replaced.
- (5) An armature found with one part especially damaged by burning should be strictly tested by the insulation test.

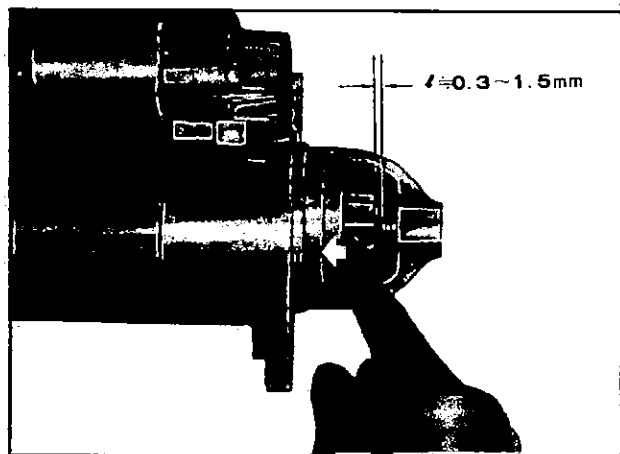
ADJUSTMENT

a. Meshed Pinion Position by Magnetic Switch

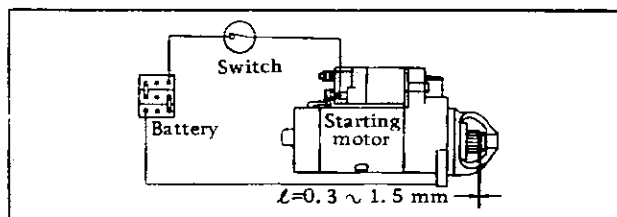
The correct clearance between the pinion stopper and pushed out pinion which is shown by L dimension in Figure must be following.

$$L = 0.3 - 1.5 \text{ mm}$$

In case that the L dimension is incorrect, adjust plunger gap of the magnetic switch by following paragraph b. Pay attention that the L dimension must be measured when the pinion is atmostly pushed out by the shift lever of the plunger and the back lash of the pinion is eliminated by pushing gear inward with finger as Figure shows. If the L dimension is incorrect, it will be the possible cause of large meshing noises or early wear and damage of the pinion and ring gear.



Checking Dimension



Cable Connection of Dimension
Adjust

b. Adjustment of Plunger Gap of Magnetic Switch

The L dimension when the plunger gap is compressed to 0, must be following in Figure.
 $L = 31.7 - 32.3 \text{ mm}$

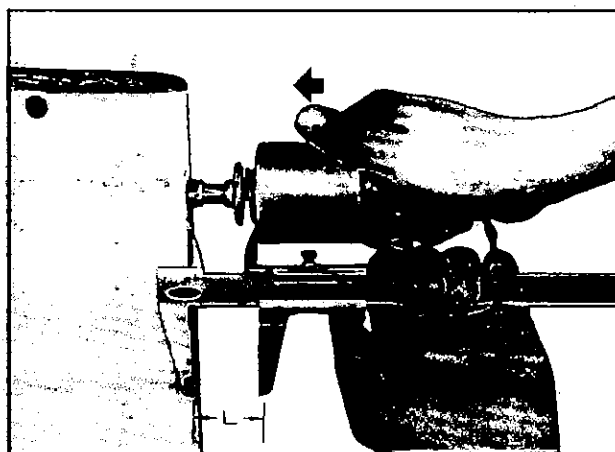
This adjustment is carried out at the adjuster and the adjusting nut.

Disassembling and Assembly Operation

Disassembling the Armature, Gear Case and Pinion

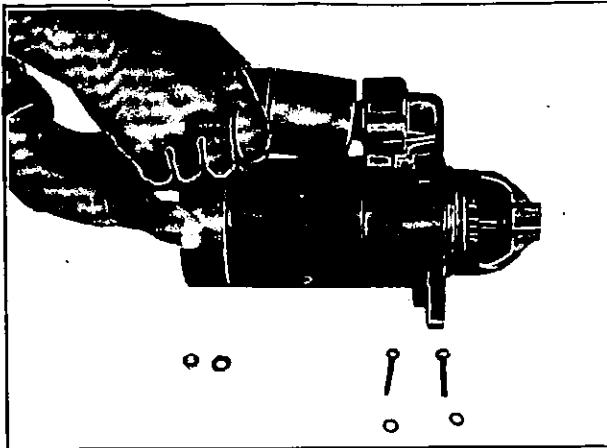
Disassembling order is shown by Figure.

Disassembly is operated by removing magnetic switch fixing bolts, through bolts and the armature shaft clip. Before disassembling main body, remove brushes by unscrewing brush fixing screws as Figure.

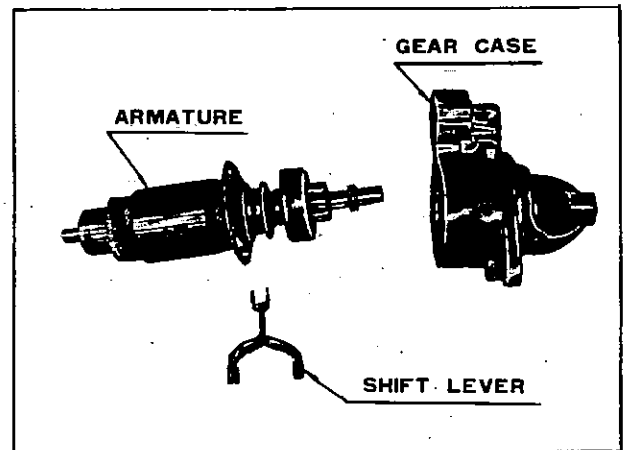


Measurement of Plunger Gap

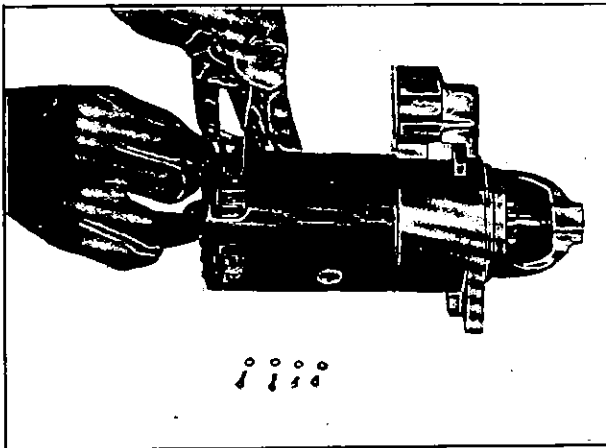
ELECTRICAL SYSTEM



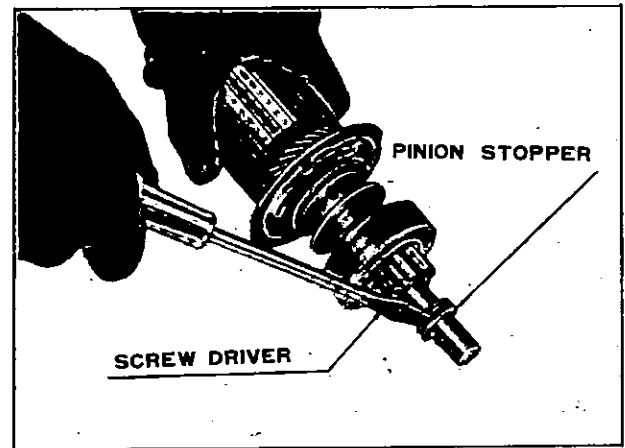
Removing Magnetic Switch



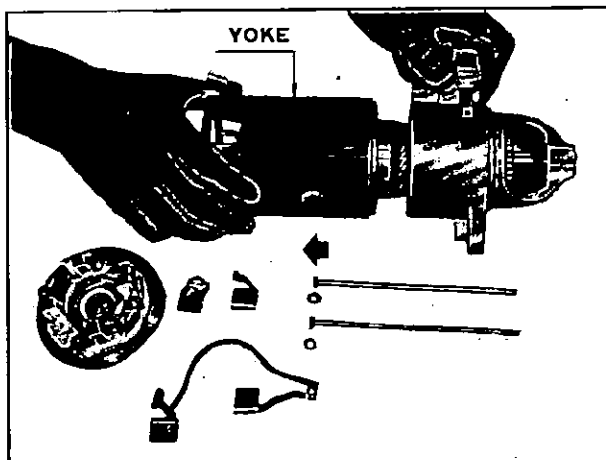
Disassembling Armature and Gear Case



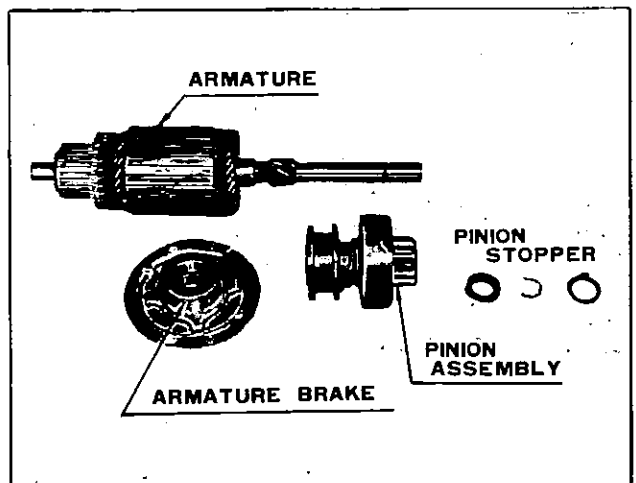
*Drawing out Brushes
(After removing fixing screw)*



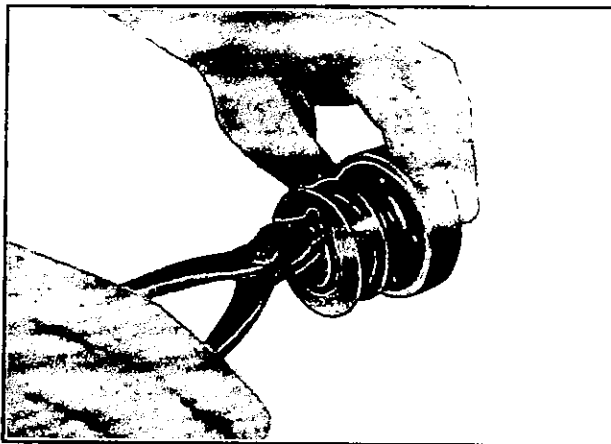
Removing Pinion Stopper



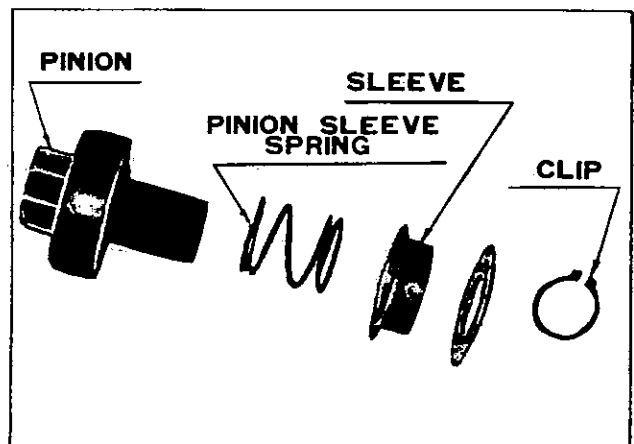
Drawing out Yoke



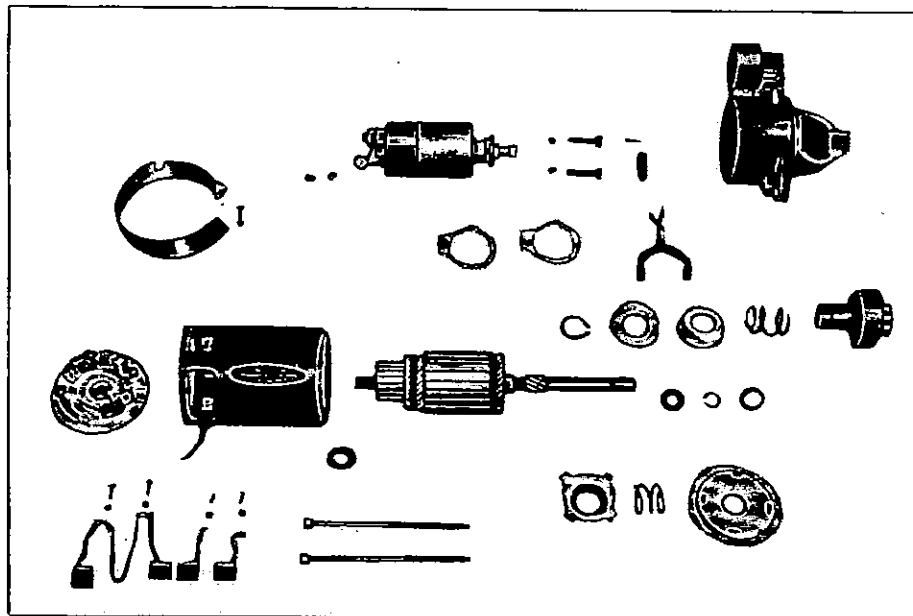
Disassembling Armature



Removing Pinion Clip



Disassembling Pinion Subassembly



Display of all Component

Disassembling Pinion

Disassembling is carried out by removing pinion clip as Figure.

Assembling and Testing Starter

Reassembling is performed by following the reverse procedure for disassembling. All frictional parts are lubricated with mobile oil (SAE 30) while the bearings are coated with a small amount of grease circuit in the magnetic switch and causes the main circuit S_2 in the magnetic circuit to close. Releasing the

starter switch opens the magnetic circuit which also opens S_2 .

- (1) Causes for magnetic switch failing to operate can be divided into electrical and mechanical sources.
Causes for electrical troubles.

(A) Current failure in magnetic circuit.

When the starter switch in pressed and the current falls to pass through the magnetic circuit, most of the trouble is due to broken soldered connection

between the magnetic coil wire and the magnetic switch (+) terminal, and defective ground connection from the coil wire to the magnetic switch body.

(B) Defective contact in main circuit S₂.

When the magnetic circuit is satisfactory and S₂ is closing but only a small current flowing due to high contact resistance, and the opposite case of switch S₁ opening but S₂ remains closed. In either case, the trouble lies in the faulty moving of the core or roughness of the contacting point surface. Therefore polished the surface well, then the operation will become satisfactory.

Causes for mechanical troubles.

Failure to operate is caused in many cases by the guide shaft on the moving core of the magnetic switch main circuit S₂ sticking against the cover hole.

Correction can be made in this case by loosening the cover screws (4 pieces) and retightening them so that the shaft moves freely.

(2) Precaution

In removing nuts from the magnetic switch main circuit terminals when installing or removing cables, the lower nut of the double nuts should be kept in a tightened state while unscrewing. If the lower nut is loose, the terminal bolt may turn together and ground the terminal to the cover and cause damage.

Starter Troubles, Their Causes and Remedies

The following is a list of troubles which can be determined from the state the starter is installed on the engine.

(1) Starter fails to turn.

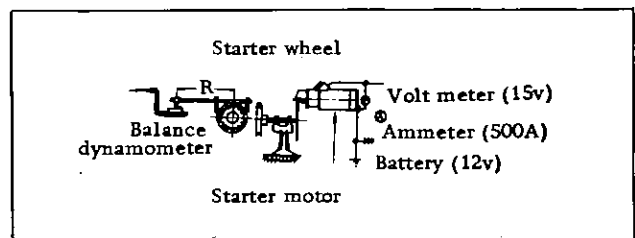
The engine is checked to see if it can be cranked by hand.

If it cannot be cranked, the engine is at fault and should be checked. If it can be cranked easily, the starter including the wiring should be checked and correction made accordingly.

Is the battery run down? Check the specific gravity of the battery fluid to see if it is over 1.240 and recharge or replace the battery as found necessary.

All loose battery and ground cables should be cleaned and properly tightened.

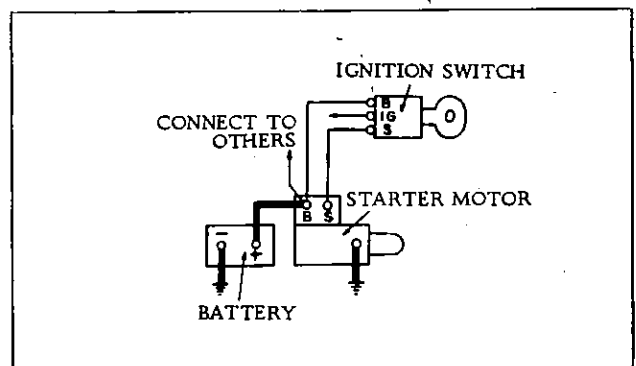
(Magneto grease or Gargoyle (BRB No.1)). All cord connections are carefully tightened and special attention given to the condition of insulation. The assembly check is made by testing the starter as a single unit using a fully charged battery. Tests are made with a starter motor tester or with the apparatus shown in Figure by which braking torque is measured. In this case, the normal value should be 0.9 m-kg.



Torque Testing Apparatus

Construction of Magnetic and Switch Instructions

The magnetic switch is an apparatus when the engine is being started by shift lever, serves to close the circuit between the battery and the starter motor, and permits a large current to flow and actuate the starter motor. After starting or when the engine is stopped, the switch serves to keep the circuit open. The principles of operation can be seen from Fig. 8. Closing the starter switch S₁ allows the current to flow through the magnetic.



Magnetic Starter Circuit

DATSUN 1000

If there is trouble in the magnetic circuit, it should be corrected.

For improperly contacting starter brushed, the brushes together with the armature should be checked, and corrections or replacement made as found necessary.

If all of the above checks with their corresponding repairs have been made and the starter still fails to operate, the trouble can be assumed to be in the starter itself so that it should be removed from the engine and checked.

This is exceedingly rare but care should be taken to see that the starter pinion is not locked into the flywheel ring gear. Cases like this are usually caused by badly worn gears meshing improperly and if the defect is not too severe, it can be remedied by placing the gear shift lever into fourth speed and rocking the car back and forth to free the gears. If this trouble is frequently repeated, the starter should be dismantled from the engine for checking and repairs.

- (1) Starter turns but its turning power is weak and fails to start the engine.

If the trouble is due to a run down battery, loose terminals, troubles in magnetic shift switch, worn and sticking brushes, dirty and damaged commutator, etc., the checking and repairs are made in the same manner as described in the preceding chapters.

If the outer surface of the armature is rubbing against the core, the starter should be dismantled, disassembled and repaired.

Besides the above, there is the case of the pinion meshing improperly. If the trouble is due to the gear teeth being badly worn, the gears should be replaced but if it is due to the screw guide on the pinion shaft being dirty and not allowing the pinion to advance smoothly and causing improper meshing, the shaft should be cleaned and oiled.

- (2) Starter exceeding noisy when operation. The flywheel ring gear is checked and if the teeth are deformed, they should be repaired or the gear replaced.

Rattling noise caused by loose starter mounting bolts are corrected by retightening the bolts.

Noise caused by brushes improperly contacting the armature required correcting as this condition not only produces noise but will hasten wear on both parts.

Noises made by the armature rubbing against the core while in operation is caused by too large a clearance between the armature shaft and the bushing so the worn parts should be replaced. Wear between the shaft and bushing is due to lack of oil so that attention should be given to proper lubrication.

Lubricate once every half year using good grade of machine or mobile oil and lubricate the parts through the oil nipples. The amount of oil required is about 0.5 cc. for each bracket.





SERVICE MANUAL

B O D Y

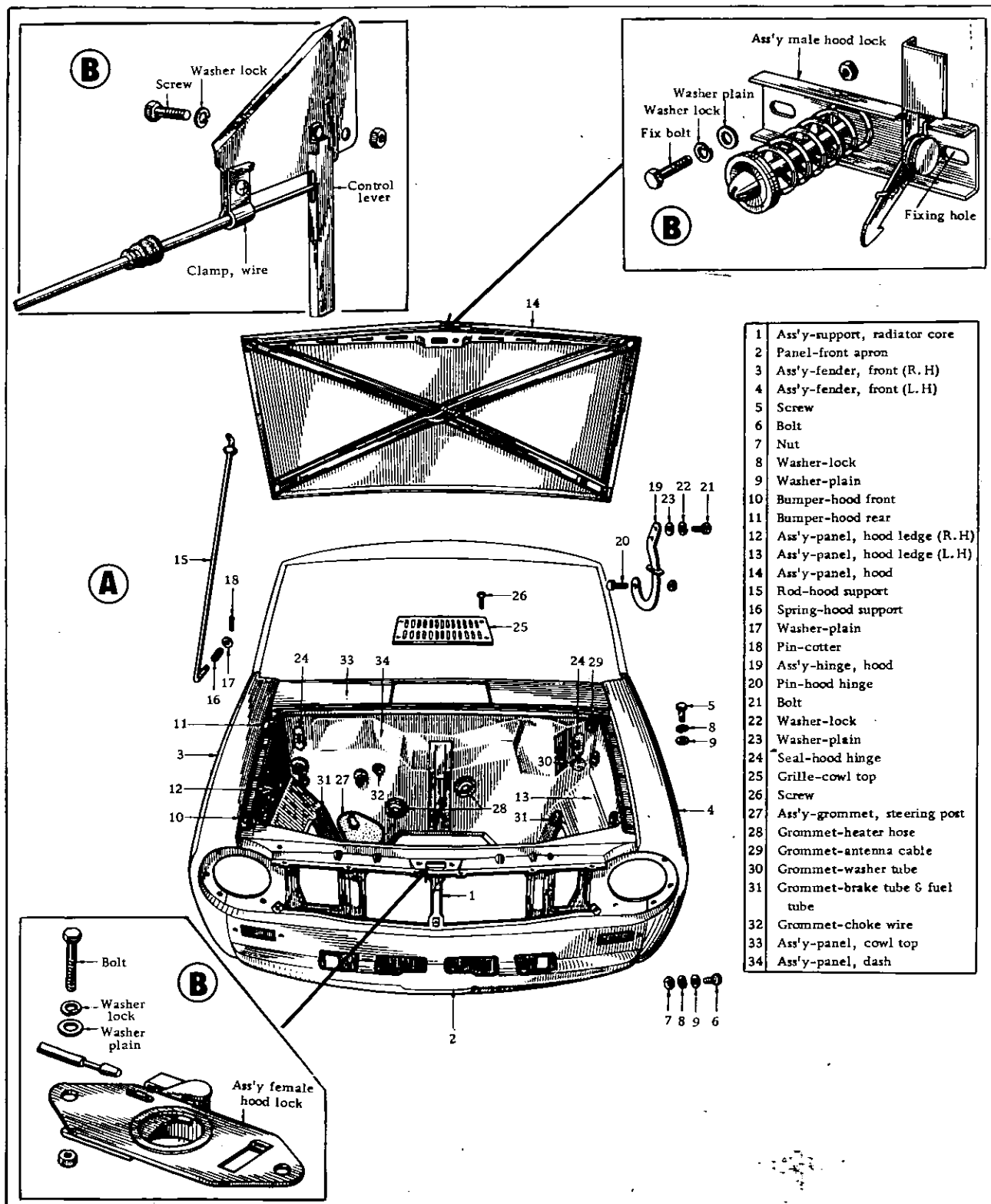
MODEL B10 SERIES



NISSAN MOTOR CO., LTD.

BODY

BODY



(A) Front Panel & (B) Hood Lock Control

DATSUN 1000

HOOD LOCK CONTROL

Removal

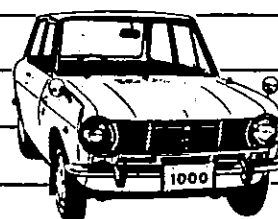
- o Remove the radiator grille.
- o Disconnect the female hood lock assembly from support of radiator grille and separate from the cable.

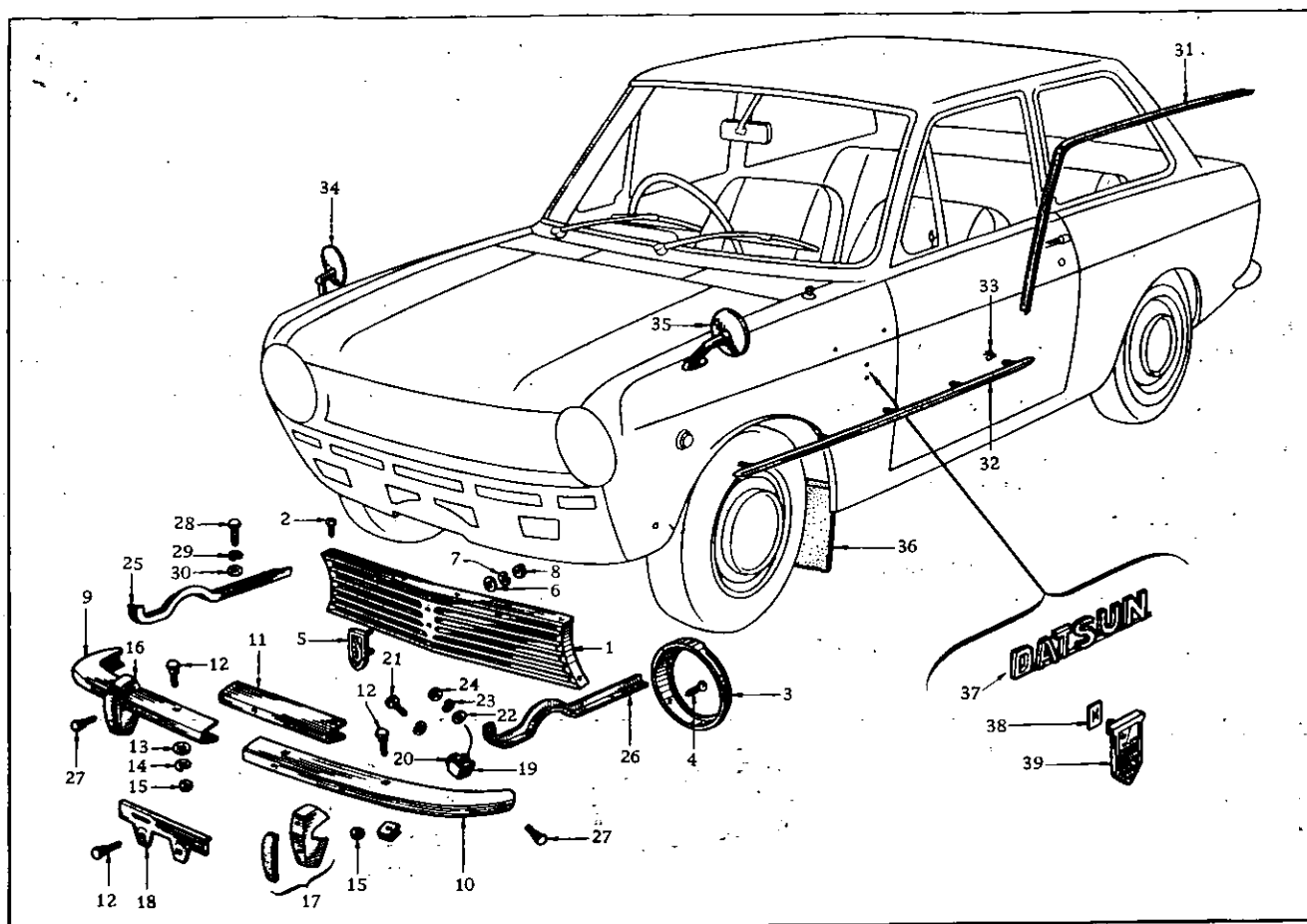
To disconnect the control wire, separate the cable from the release lever at the edge of cable.

Assembling is a reversal of disassembling procedure.

Adjustment

- o Adjust the position of male lock by sliding fix hole by loosening the fix bolts.
- o Adjust the position of male by turning the bolt to the left way.





View of Front Side

1	Grille-radiator	14	Washer-lock	27	Bolt-B
2	Screw-tapping	15	Nut	28	Bolt
3	Rim-head lamp (L. H)	16	Override-front bumper (R. H)	29	Washer-lock
4	Screw-tapping	17	Override-front bumper (L. H)	30	Washer-plain
5	Set-emblem, radiator grille	18	Bracket-licence plate	31	Moulding-roof drip
6	Washer-plain	19	Bracket-front bumper side	32	Moulding-body side sill
7	Washer-lock	20	Washer-rubber	33	Clip-body side sill moulding
8	Nut	21	Bolt	34	Ass'y-back mirror, outside (R. H)
9	Bumper-front (R. H)	22	Washer-plain	35	Ass'y-back mirror, outside (L. H)
10	Bumper-front (L. H)	23	Washer-lock	36	Mud guard-front fender
11	Connector-front bumper	24	Nut	37	Emblem-"DATSUN", front fender
12	Bolt-bumper B	25	Stay-front bumper (R. H)	38	Clip-tubular
13	Washer-plain	26	Stay-front bumper (L. H)	39	Badge-"Deluxe" front fender

Front Fender

- o Remove the side moulding and mud guard of front fender.
 - o Remove the side flasher lamp and head lamp from hood ledge.
 - o Take off the side bracket of front bumper from the fender and bumper.
 - o Disconnect the attaching bolts of fender.
 - o Opening the front door, take out the attaching bolts from front pillar.
 - o Detach the fender from the body.
- Assembling is a reversal procedure of disassembly.

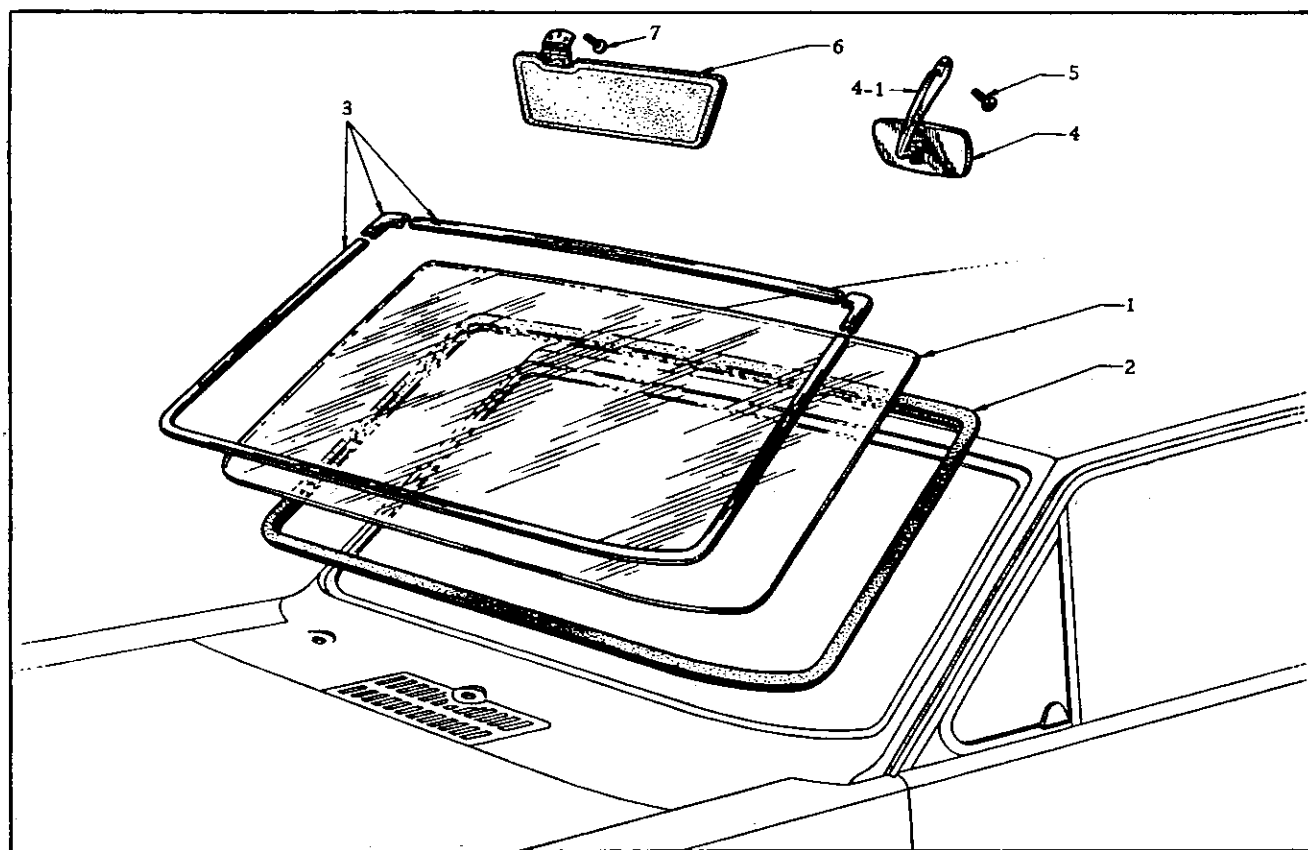
DATSUN 1000

Disconnect

- o Take off the wiper arm of windshield.
- o Remove the outside moulding around windshield.
- o Separate weatherstrip from body with a spatula at the outside and inside.
- o Disconnect the wind glass with strip from frame.

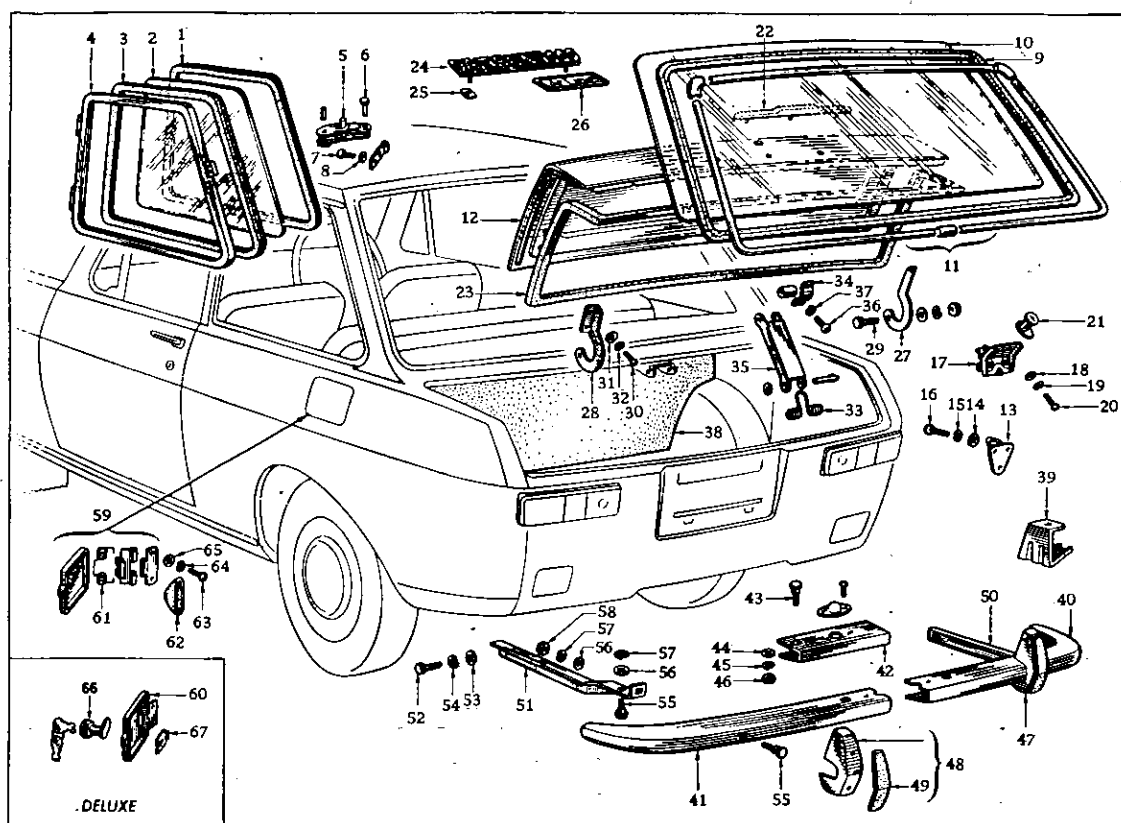
Assembling the Glass to Strip

- o Set the weatherstrip to the glass.
- o Insert a cotton rope on strong cord in pinch of rubber channel completely around windshield.
- o Tie ends of it to inside surface of glass at bottom center of glass.
- o Fit the glass for correct position on the frame.
- o Hold ends of it by inside worker and pulling it so as to over flange of the body.
- o Holding the inside edge of it, pull it from right and left side so as to over the flange of body.
- o In this case, tapping the surface of glass by hand to fix closely between the weatherstrip and the flange of body by giving vibration.
- o Correct the lip of weatherstrip by a spatula after fixing the glass in position.
- o Using a pressure type applicator, seal inner and outer lips of rubber channel to glass with an approved weatherstrip adhesive.
- o Seal are to extend completely around rubber channel.
- o Clean of excess sealer from windshield glass with mineral spirits.



Front Window & Windshield Fitting

1	Glass-windshield	4	Ass'y-back mirror, inside	6	Ass'y-sun visor
2	Weatherstrip-windshield	4-1	Arm-back mirror inside	7	Screw
3	Set-moulding, windshield	5	Screw		



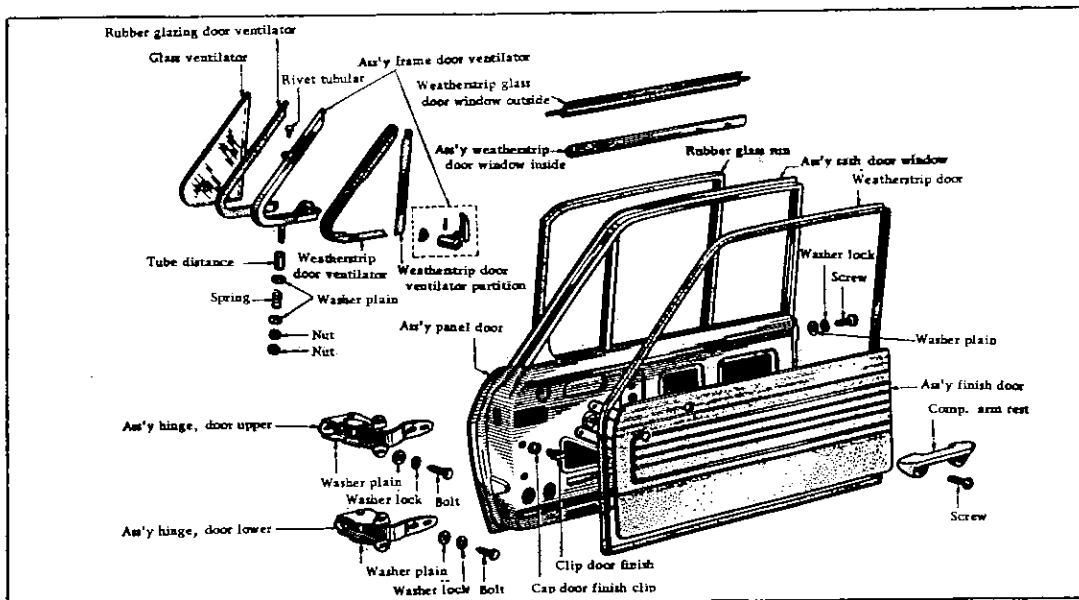
Sectional View of Rear Side

1	Weatherstrip-side window	24	Emblem "DATSUN 1000"	46	Nut
2	Glass-side window	25	Clip-tubular	47	Override-rear bumper (R. H)
3	Rubber-side window	26	Mark-"Deluxe"	48	Override-rear bumper (L. H)
4	Ass'y-sash, side window	27	Hinge-trunk lid (R. H)	49	Rubber-override
5	Ass'y-handle, side window	28	Hinge-trunk lid (L. H)	50	Stay-rear bumper (R. H)
6	Pin-handle, side window	29	Pin-hinge	51	Stay-rear bumper (L. H)
7	Screw	30	Screw	52	Bolt
8	Washer	31	Washer-plain	53	Washer-plain
9	Weatherstrip-rear window	32	Washer-lock	54	Washer-lock
10	Glass-rear window	33	Spring-stay, trunk lid	55	Bolt-bumper B
11	Set-moulding, rear window	34	Stopper-stay, trunk lid	56	Washer-plain
12	Ass'y-lid, trunk	35	Ass'y-stay, trunk lid	57	Washer-lock
13	Striker-trunk lid lock	36	Screw	58	Nut
14	Washer-plain	37	Washer-lock	59	Ass'y-lid, fuel filler
15	Washer-lock	38	Board-finish, trunk room	60	Ass'y-lid, fuel filler
16	Screw	39	Holder-jack lever	61	Spring-filler lid
17	Ass'y-lock, trunk lid	40	Ass'y-bumper, rear	62	Bumper-rubber
18	Washer-plain	41	Bumper-rear	63	Screw
19	Washer-lock	42	Connector-rear bumper	64	Washer-lock
20	Screw	43	Bolt-bumper	65	Washer-plain
21	Ass'y-cylinder, trunk lid lock	44	Washer-plain	66	Ass'y-lock, fuel filler lid
22	Ass'y-handle, trunk lid	45	Washer-lock	67	Clip-filler lid lock
23	Weatherstrip-trunk lid				

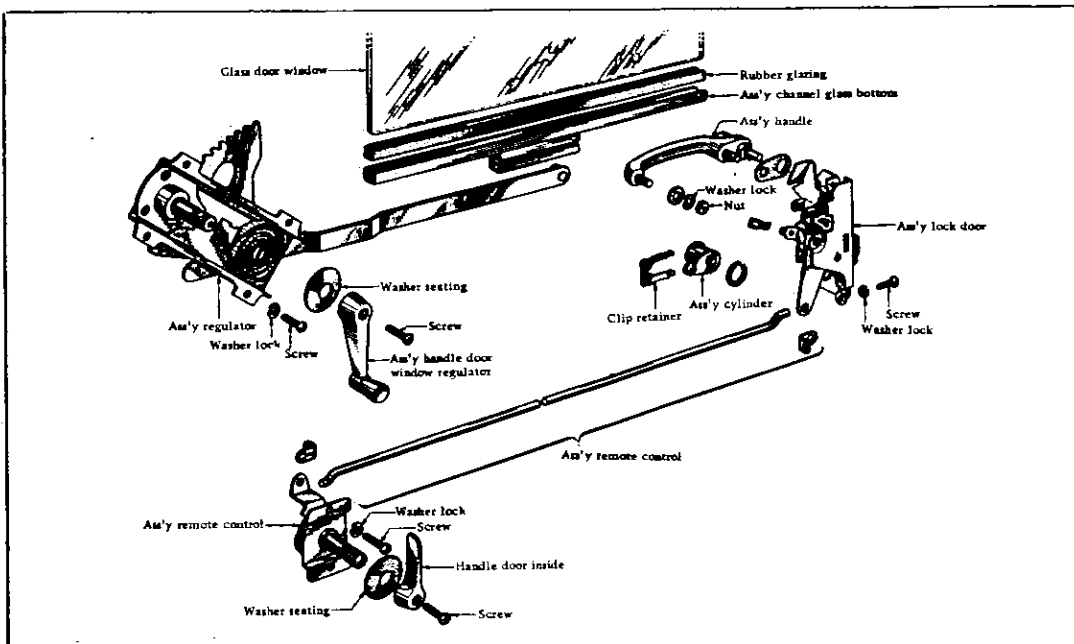
Removal of Trunk Lid Lock

- o Opening trunk, remove the lock bolt of it.

- o Disconnect retaining clip for lock cylinder and remove the lock cylinder from lid panel.



Components of Door Fitting



Construction of Door Lock & Regulator

Door Finish

Removal

- o Remove the door finisher from inside of door by screwdriver disconnecting clips.

Window regulator

- o After removing the door finisher and inside sealing screen, remove screw of the window regulator.

- o Take off the screw at the lower side of door sash center pillar.
- o Drop the regulator to the bottom of door, take out it from the inside panel hole.
- o Disconnect the top of regulator arm from the groove of glass channel.

Assembling is a reversal procedure of disassembling.

John Douglas. spare parts.
(Book on Transmission Automatic.)
Ed. Hedevold 16th May 73.

3N 71A. — 3N 71B. Automatic.
for Box.
